AUGUST 2, 1951

IRON AGE

VOL. 168 NO. 5

CONTENTS

★Starred items are digested on opposite page.

EDITORIAL — Dangerous "Diplomacy" 7

NEWS OF INDUSTRY

Iron Age Introduces 68
Iron Age Salutes 69
★ORE BOATS—Greatest Building Program Ever 103
★ALUMINUM—In's and Out's of Expansion 104
★PAINT SAVING—Develop New Spraying Method 105
★CONTRACTS—Congressional Fury without Action 107
Industrial Briefs 108
NPA VIOLATIONS—Clear Path for Court Action 109
Controls Digest 109
Certificates of Necessity 118
Construction Steel News 118
Clearing House 164

NEWS ANALYSIS

Newsfront 11
★Machine Tool Highspots 29
On the Assembly Line 72
★West Coast Progress Report 77
★The Federal View 79

TECHNICAL ARTICLES

★18-8 Can Be Cured 81
New Books 85
★Tallow Can Replace Palm Oil in Hot Dip Tinning 86
New Pallet Eliminates Forks 89
Etched Pattern Identifies Lighter Tinplate Coat 90
Continuous Dip System Improves Tar Coating 92
★Effect of Structure on Machinability Demonstrated 95

MARKETS & PRICES

★The Iron Age Summary 15
Market Briefs and Bulletins 135
Nonferrous Metals Outlook 136
Iron and Steel Scrap Market 138
Iron and Steel Scrap Prices 140
Comparison of Prices 142
Steel Prices 144
Ferroalloy Prices 152

REGULAR DEPARTMENTS

Dear Editor 20
Fatigue Cracks 24
Dates to Remember 32
New Equipment 34
Free Publications 35

INDEX OF ADVERTISERS 180

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DIGEST

of the week in metalworking

STEEL INDUSTRY AGHAST AS CMP RUNS WILD

PAGE 15 Some manufacturers who thought they were well fixed under CMP may be forced to cut production within 60 days because their orders can't be filled. Both makers and users of steel are disgusted. Some defense items are affected. One steel producer calls it the worst thing ever in his industry.

MACHINE TOOL MEN WANT CASH, PRIORITIES

PAGE 29 Financial assistance, super priorities, and manpower help were asked for the machine tool industry by its advisory committee, meeting with NPA last week. It again complained about the profit-controlling GOR 15, issued as the supposed answer to the machine tool field's pricing problems.

INCREASED INGOT RATE DUE IN NORTHWEST

PAGE 77 Conversion of an electric side charge furnace to top charge will add about 12,000 tons to annual capacity. Contaminated scrap is still a headache. Decontamination is raising scrap costs at furnace from $75 to $100 per ton. Northwest magnesium plant will again be in operation soon.

SUPER PRIORITIES IN THE HOUR OF NEED?

PAGE 79 Graded priorities for defense production are on the horizon. First U. S. admission that the present I band system is becoming unworkable was given at an NPA-machine tool meeting. The NPA believes it could justify "A" and "AA" priorities for machinery to step up machine tool production.

HEAT CURES 18-8 INTERGRANULAR ATTACK

PAGE 81 Intergranular attack of 18-8 can be cured by holding it for long periods of time in the sensitizing temperature range. Chromium diffusion from unaffected areas into the impoverished grain boundary area, rather than dissolving precipitated chromium carbides, apparently causes the recovery.

TALLOW FOR PALM OIL IN HOT DIP TINNING

PAGE 86 Mill tests indicate modified beef tallow can replace palm oil in hot dip tinning. It is cheaper, not imported, and it can be tailor-made to varying specifications. It needs no dewatering, preheating, or dilution prior to use. This new method could prove itself a blessing in wartime.

EFFECT OF STRUCTURE ON MACHINABILITY

PAGE 95 Investigation of 3140, 4140, and 8640 steels shows their machining properties are the same when they are heat-treated to the same structure. Structure is a better criterion of machinability than chemical composition. Resulfurization to about 0.1 pct significantly improves machinability.

ORE BOAT BUILDING BIGGEST IN HISTORY

PAGE 103 The ship building and conversion program of Great Lakes carriers to boost shipments of iron ore is the greatest in history. The fleet, which handled over 78.2 million tons in 1950 hauled nearly 11 million tons more this season so far. More than 20 ships will get into lakes service in 1951-52.

IN'S AND OUT'S OF ALUMINUM EXPANSION

PAGE 104 The aluminum industry is on a wide path to expansion. War or not the industry would have been on the growth uptrend but abnormal crisis demand has forced it into a run. Both government and industry are pushing expansion but some of Washington planners' thinking has been thrown off base.

PAINT SAVING WITH A NEW SPRAY METHOD

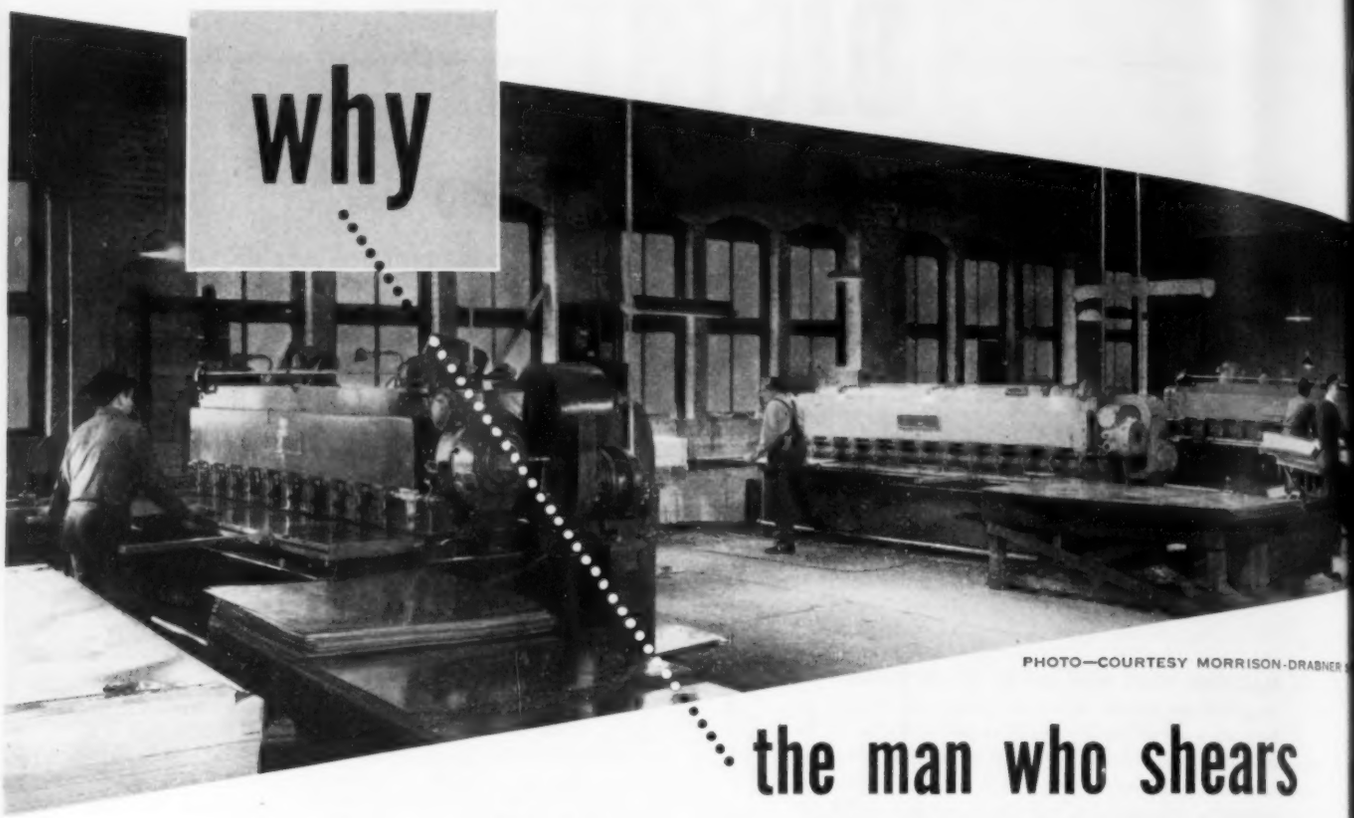
PAGE 105 A brand new way of spraying paint was unveiled by the Ransburg-Electro-Coating Corp. in Indianapolis last week. It is called the Ransburg No. 2 Process to distinguish it from the company's other electro-spray system. Paint utilization efficiency is high and paint savings run very high.

HOT AIR DOESN'T HELP SMALL BUSINESS

PAGE 107 Little companies would be riding high if hot air could help small business. But the pay off is in orders not in talk. The little guys feel that they aren't getting a fair share of orders. Big contracts are nevertheless being placed with the larger prime contractors at about the World War I ratio.

HIGH-VELOCITY BURNER SAVES FUEL, SPACE

NEXT WEEK Used with standard accessories, this ram-jet-principle burner reduces heating equipment volume as much as 75 pct. It completely vaporizes and burns liquid or gas fuel, producing soot-free stack gases, or heat and special atmospheres. Excess air is not needed to insure good combustion.



PHOTO—COURTESY MORRISON-DRABNER

the man who shears for a living uses Cincinnati Shears!

He gets a quick and satisfactory return on investment — many a Cincinnati Shear has totally paid for itself in less than a year.

Cincinnati Shears produce accurate blanks without costly dies or special setups — cut production costs to the bone. They satisfy a critical trade and promote business.

The machine tool like accuracy, the rapid gauging, the ability to shear quickly and satisfactorily make the Cincinnati All-Steel Shear a profitable machine in any shop.

Write for Catalog S-5, illustrating Cincinnati All-Steel Shears.

CINCINNATI

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SHAPERS · SHEARS · BRAKES

Dangerous "Diplomacy"

IN these days of jittery international diplomacy, irresponsible statements by the heads of major countries can stir up future trouble.

Recently Mr. Truman, in a letter to the Prime Minister of Iran, said "You know of our sympathetic interest in this country in Iran's desire to control its natural resources. From this point of view we were happy to see that the British government has on its part accepted the principle of nationalization."

Those are strange words from the President of a country whose people believe first and last in private initiative and scorn socialism.

Who says the American people are in sympathy with seizure of a British oil company by a government which had a contract with that company accepting private operation?

We should not be drawn into this fracas in such a way that it looks as if we favor seizure of private capital or investments in foreign countries.

What makes Mr. Truman think we are happy because England has accepted the principle of nationalization? What makes him sure England has accepted the principle of seizure of British property abroad?

Millions of Britishers do not favor socialized medicine. Almost half of them do not favor nationalization of iron, steel and coal. Even if they all favored this (which millions don't) it is quite unnatural for the President of the United States to give the impression abroad that Americans are happy about the principle of nationalization.

Our good friend Canada is cooperating with private American and Canadian capital to supply vital iron ore to this country. Canada has been most generous and logical in seeing that private initiative and free enterprise tackled this great job of railroad building and mining and distribution to U. S. A.

Another friend of ours, Venezuela, has cooperated with American steel firms in supplying iron ore to mills here. There has been no hint of nationalization, now or later.

Who could blame those countries for interpreting Mr. Truman's remarks to Iran's Prime Minister as an invitation for them to "take over" at some future date? Such "diplomacy" is dangerous to the future of this country. It is dangerous to our relations with honorable neighbors who believe in our policy that private capital can do a far better job than government seizure or nationalization could ever do.

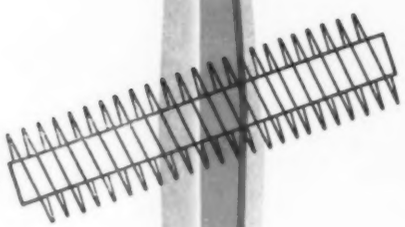
Tom Campbell

Editor

TIME IS OF THE ESSENCE

. . . *in producing essential products*

Here are three Wolverine developments in tubular forms which, introduced as components of your products, can contribute immeasurably in saving time and critical materials, first in installation, and then in the subsequent operation and maintenance of such products.



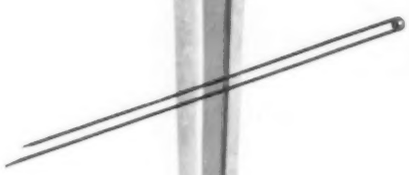
1

WOLVERINE TRUFIN*—used for heat transfer work, is outstanding in time-saving qualities. Since the fins are integral with the tube itself, they will withstand vibration and the tube will remain in service an exceptionally long time. This obviously reflects in fewer and less frequent tube installations. With Trufin providing an increased ratio of outside to inside surface, the performance over plain surface tube, in many cases, will be more than doubled. The saving of time, and space too, is obvious.

2

SPUN END PROCESS†—is proving a great time-saver. Its use has enabled many manufacturers—often through a simple change in the design of tubular parts (components of their products)—to completely eliminate separate end closures or other assemblies and also reduce the time and cost of assembly operations.

† *Re Issue 22465*



3

CAPILATOR*—the Wolverine capillary tube used for restriction purposes—is unique in its field. Its bore is plug drawn, assuring a perfectly smooth inside surface that allows a uniform, uninterrupted flow through the tube.

* *Reg. U.S. Pat. Off.*

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Export Department, 13 E. 40th St., New York 16, N. Y.

IRON AGE *newsfront*

news methods and product forecast

► Although the machine tool builder concerned denies that a deal is set, at least one plant — and possibly three — of a major auto manufacturer is preparing tooling for production of one of the hardest-to-get types of machine tools. This subcontractor could reach a higher production rate than the original machine tool builder.

► Highly skilled machinists are doing menial labor in some new defense plants because the machine tools haven't been delivered. This has hurt the advance hiring programs of skilled labor at these plants.

► 20 mm cartridge cases extruded from bar stock may only require one quarter of the steel needed to produce the same case from sheet steel.

► Top steel mill management is at a premium. A decision on a new eastern plant by one big mill was postponed chiefly because of the skilled help shortage.

► If you're on the free market steel list and don't get delivery, don't be surprised. The 95 pct set aside tonnage on any given steel mill product is equivalent to 100 pct. It is impossible to estimate production within 5 pct.

► There are two price lists on auto parts supplied by independent jobbers to auto producers. The higher price list applies when premium priced steel must be used to make the parts. Sometimes the auto producers help the outside shops get this tonnage.

► Some of the auto builders will be late in getting out their 1952 models. Several firms may soon decide to postpone their 1952 model changes a full year.

► The metal shortage is booming the use of metallic acetates. Most applications are for decorative purposes as this metallic looking plastic has a mirror-like finish.

► Copper production in Northern Rhodesia may receive ECA aid. Ore reserves are estimated to be around 100 million tons.

► Naval bases and commercial television are still only remotely akin. The British have captured the Spanish television network and will erect two British marconi towers one at Madrid and the other at Barcelona.

► Belgian Congo will supply more of our raw materials. Beside financial help to increase manganese, cobalt, copper, tin and uranium production we will help build three power stations on the Congo River.

► Bethlehem Steel has raised its sights on Venezuelan ore imports. They now hope to import 4.5 million tons per year instead of the 2 million tons per year originally planned. Bethlehem's El Pao deposit is thought to contain about 70 million tons.

► Under a plan to stimulate production of jet engines in Britain, the U. S. is offering to ship 3800 machine tools to the British. Just where these machines will come from is a mystery in U. S. machine tool circles.

Why monkey around with inferior tubing?

Bundyweld Tubing, double-walled from a single strip. Exclusive, patented beveled edge affords smoother joint, absence of bead, less chance for any leakage.

Why fuss around with the costly production delays, poor performance and other monkey business an inadequate tubing can get you into?

Let Bundyweld show you what tubing features really are!

This multiple-wall type of Bundy® tubing is double-rolled from a single strip. No other like it. It's extra-rugged, easy to form and highly resistant to vibration fatigue. It's thinner walled, yet stronger walled, won't leak under pressure or burst under normal strain.

For help on any application of small-diameter tubing, why not check Bundy Tubing Company today?

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AFFILIATED PLANTS IN ENGLAND, FRANCE AND GERMANY

IRON AGE *summary*

iron and steel industry trends

Steel market tangled . . . Producers disgusted with controls . . . Sales offices jammed . . . But some consumers like CMP fairly well so far.

It All Depends—What you think of the Controlled Materials Plan so far depends pretty much on whom you are. If you are a steel producer, you probably think Washington has gone too far with controls. The market is in a terrible tangle, and it will get worse. If you are a steel user, your opinion will vary from good to bad depending on your size and the type of product you make. If you are a Washington official, your hand is frozen on the controls throttle which has been pushed to full-speed-ahead.

Most mills are booked through the fourth quarter to the limit of their required acceptance. In addition, CMP orders for the first quarter of 1952 are pouring in, and the early months of the year are filling up rapidly. But this hardly tells the story. As usual, the steel sales office is the receiving station for all the confusion, clamor and frustration attending an oversubscribed market.

Only One Guess—Steel salesmen are being hit from every possible direction. Disappointed CMP ticket holders are hammering away with personal visits, telephone calls, wire and letters. All want to know why their allotments have been returned. No wonder sales offices are swamped with paper work, since all this has to be handled in addition to volumes of regular records and forms the government requires.

Customers are criticizing steel salespeople for not returning steel allotments more quickly. The reason is simple: So many CMP tickets were issued that if a customer guessed wrong on his first choice of a mill he was out of luck —by the time his order was rejected it was too late for him to place it with another producer. One veteran steel sales executive told THE IRON AGE that "the CMP debacle is the worst thing that ever happened to the steel industry."

Bleak Outlook—Some steel consumers who were unable to find a home for CMP orders may be forced to curtail production within 60 days. The steel they thought was a sure thing to keep their plants running won't be there. This is hard for them to understand. It sounded so simple in theory that they were sure that it would answer their supply problems. When it doesn't, they are amazed and some are angry, feeling they have been gypped.

Some of the orders mills have been forced to reject are for important programs. One was from a manufacturer of parts for tanks, others were from railroad car builders. But steel people think the cries of anguish being heard this week are mere whispers compared to what is coming if CMP ticket holders are forced to cut back production. If layoffs result, the voice of labor will join the chorus.

The Brighter Side—Despite the rough sailing that CMP has encountered, it still has considerable support among steel users. Generally, the small companies favor it more than the large ones. This is probably true because big firms feel more confident of winning their procurement battles in a free market. Also, very small users like the advantage they now have of certifying their own needs.

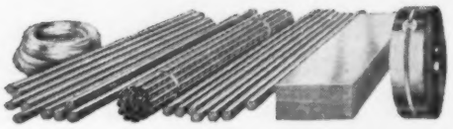
A surprising number of steel users are fairly well satisfied with what they are getting — even though their steel requests have been cut. This may indicate that they had overstated their needs.

Forlorn Optomists—If the auto industry is brought under CMP, as is now generally expected, they will get little comfort from it. Steel people believe their CMP allotments won't be worth the paper they are written on, unless they receive special consideration.

During the past week there has been an industry-wide crisis on wheel steel. This situation may be cleared but hot-rolled strip is already a new bogey on the horizon.

Steelmaking operations this week are scheduled at 102 pct of rated capacity, up half a point from the previous week.

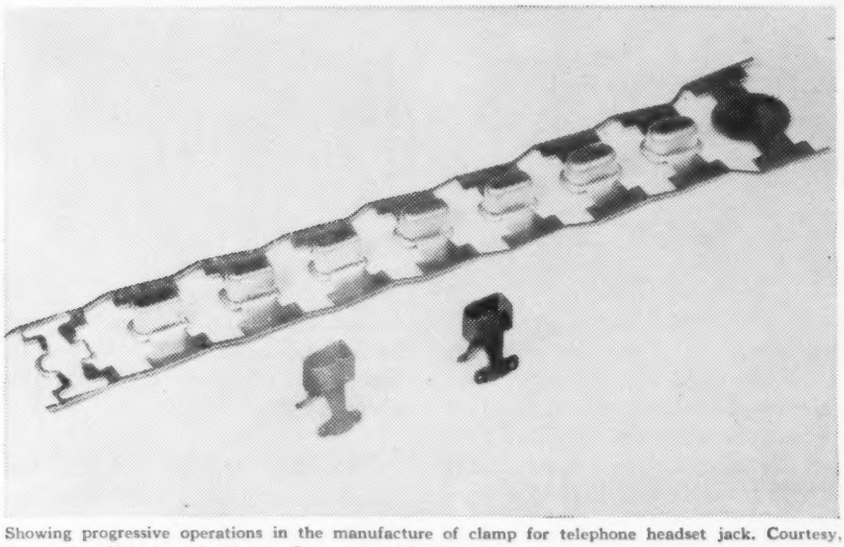
(Nonferrous summary, p. 136)



BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

"Bridgeport" MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL



Showing progressive operations in the manufacture of clamp for telephone headset jack. Courtesy, Connecticut Telephone & Electric Corporation, Meriden, Connecticut.

Careful Planning Before Production

Avoids Trouble in Deep Drawing Brass

As in all things, experience in the deep drawing of brass and other copper-base alloys is the best teacher. The reshaping of flat metal into various cup-shaped objects on an efficient production basis is an intricate procedure, and involves skills and know-how. It is, therefore, wise to investigate the problem carefully before attempting to go into production. Help for the determination of the proper alloy for the particular job, and often suitable fabricating techniques as well, can be obtained from our Metallurgical Laboratory and from our literature such as Bridgeport's "Technical Handbook."

The illustration shows the progressive operations used in the production of a clamp for a telephone headset jack. This involves the deep drawing of a rectangular cup, which is not easy. Secondary blanking operations on the bottom of the cup and the formation of the brackets are shown in the small samples in the foreground. Considerable experimental work was done and further developments of the tools were necessary, which involved making two draws to obtain sufficient depth of cup. It was also found advisable to increase the width of the strip metal. The change to a lard oil lubricant was also helpful.

Factors to Consider

The following check-list should be helpful in demonstrating the various points which must be carefully considered before drawing work is actually begun.

1. *Stock* — The flat metal must be wide enough to compensate for contraction of the blank during cupping. Alloy, gauge, tolerance requirements; temper; diameter of arbor are essential.

2. *Punch and Die Radii* — Normal die radius is between 5 and 10 times the thickness of the metal. Too large or too small a die radius may cause trouble.

3. *Die Finish* — Careful polishing of the die is important, since there is a great deal of motion between the metal and the die. Dies should be lapped in the direction of metal flow.

4. *Blank Holder Pressure* — If the blank is not held tightly, the circumferential forces in the perimeter of the blank will produce wrinkling. If blank holder pressure is too great, thickening of the blank will be prevented, and may result in fracturing of the cup.

5. *Diameter Reductions*—In the production of a normal cup for redrawing, the most satisfactory diameter reduction ranges between 40 and 46%. This produces a cup about equal in height and diameter. In making greater reductions, difficulty is encountered in regulating blank holding pressures, and there is danger in the softer alloys of fracturing the cup. In progressive die operations, such as the clamp described above, successive redraws after the cupping operation are held to approximately 15%, since there are no intermediate anneals.

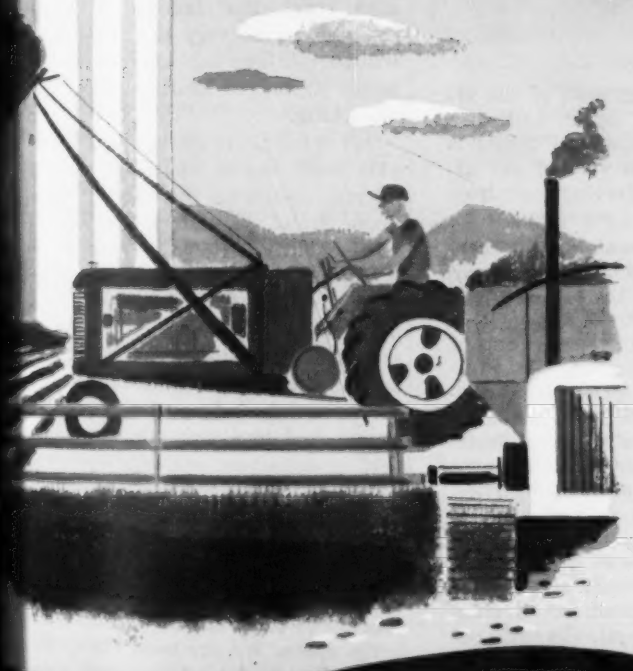
6. *Lubricants*—A lubricant must be used to reduce friction to a minimum and prevent metal-to-metal contact. It must first wet the surface thoroughly, and have sufficient body to stay in place under forming and drawing pressure. The choice of lubricant for a job depends on several factors, including the severity of work, equipment used, production run, means of application and cost. Usually simple soap solutions are satisfactory, but lard oils, vegetable oils and other lubricants are often used.

7. *Metal Surface Finish*—This is important especially in deep drawing operations such as in progressive and eyelet types of work.

This list is intended simply to point out some of the factors influencing success in drawing. Specific problems naturally arise in every individual job. Bridgeport will be glad to help customers with these problems by sharing its vast reservoir of experience acquired in the production and fabrication of copper-base alloys. (6831)

Van Huffel
cold-formed metal tubing
and shapes solve problems
for the makers
of

farm equipment



It may be a far cry from vegetables to Van Huffel, but farm equipment manufacturers will tell you they are both basic in the scheme of things.

For instance, where deadweight must be cut from a tractor without sacrificing strength . . . where a farm implement must be easier to carry, move or lift without complicated fabrication . . . a lot of production problems are being solved by the versatility of Van Huffel metal shapes and tubing.

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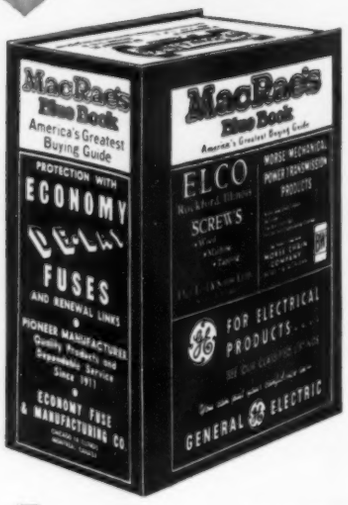
SHORTAGES AHEAD



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ALL in ONE BOOK

Dear EDITOR

letters from readers

Controls

Sir:

Your editorial "Controls Are Like Narcotics" in the July 19 issue certainly hits the nail right on the head. I can't remember any time when we have had more confusion and unsatisfied customers.

You are to be congratulated upon bringing this to the attention of your public.

R. E. CUNNICK
Vice-President

The Niles Rolling Mill Co.
Niles, Ohio

Boron Steels

Sir:

The opening paragraphs of the article "Boron Steels" by D. I. Brown in your July 5 issue are of considerable interest to us in view of our association with this development from its inception some 14 years ago.

The first commercial heat of constructional steel in which hardenability was increased by the addition of a boron-containing alloy was made in November 1937 as one of a group of four heats. This program was initiated after a long series of experiments with steels of very low alloy content made for the ultimate development of a desirable addition agent to improve mechanical properties. The alloy used in these first heats is exactly the same in composition as that which has been continuously marketed since that time and carries the designation Vanadium Grainal No. 1, containing nominally: 25 pct V, 15 pct Ti, 10 pct Al, and 0.20 pct B.

The two principal alloys marketed by us contain the smallest amounts of boron of the standard boron alloys and, when added in amount to secure full effectiveness, result in the smallest total boron additions. This fact leads us to differ somewhat from Mr. Brown in several of the concise statements made under "Boron Steel Limitations" in Part I which, placed as they are in the article, are likely to attract a maximum of attention. The following comments are directed specifically to some of these points in the order in which they appear on p. 84.

(1) The statement made may be correct provided the same alloy addition agent is being considered. If, however, one boron alloy is used in the higher carbon grades and another in the lower carbon grades, it is usually a complex alloy that is used for the latter, and the total boron addition is therefore lower to secure full effect. The quantity of boron is not the sole criterion of behavior; the form in which it is added is equally important.

(2) With alloy addition agents containing very small amounts of boron the likelihood of even approaching the maximum boron stated is quite remote.

(5) Under some conditions of use, this statement may be applicable but we believe before there can be general acceptance under the broad coverage indicated much more data should be introduced.

(6) This statement is apt to be misunderstood. In view of several million tons of steel treated with boron-containing alloys having been successfully heat-treated and used this statement may unwarrantedly frighten those not having prior experience with them. For example, no steels other than the very rich alloy steels will permit long intervals between removal from the heating source and quenching.

(7) This point also needs considerable confirmation and would have to be interpreted on the basis of parts made from steel of precisely equal hardenability.

We hope that Mr. Brown's further articles will elaborate somewhat more upon the background for these broad statements, because if used by themselves they may be more harmful than helpful, and we doubt that the author had any such intent in mind.

J. STRAUSS
Vice-President

Vanadium Corp. of America
New York

Sir:

You undoubtedly plan to put out a reprint of your series of articles on boron steels. We are being stampeded with requests for all five parts even though only two have been published. Will you send us 15 copies of the series when you get your reprint out, with a statement please.

Please convey my heartfelt gratitude to Mr. Brown for putting his references at the end of the article in a comprehensible form.

F. M. WEITLAUF

The Timken Roller Bearing Co.
Canton, Ohio

The heavy demand for tear sheets on the boron steel articles has already exhausted our supply. Therefore, we are going to reprint the entire series in a 32-page booklet which will be available around the end of August.—Ed.

Advertisement

ELECTROMET Data Sheet

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

How VANADIUM improves engineering steels and helps conserve critical alloys

In these critical times when many alloying materials are scarce, you may be able to use vanadium to good advantage. Steels alloyed with vanadium meet most of the mechanical specifications for low-alloy engineering and structural steels. In fact, vanadium can often be used in engineering steels to replace at least part, if not all, of certain alloys now in critical supply.

The metallurgy of vanadium is well known. Small additions of vanadium—0.10 to 0.30 per cent—can be used effectively to give steel extra strength, toughness, and resistance to fatigue and wear. It improves engineering steels by increasing their yield strength without sacrificing ductility. The uniformly fine grain size of vanadium-bearing steels makes them tough and resistant to abrasion, fatigue, and impact.

Better Mechanical Properties

In the following table are typical analyses for carbon-vanadium and chromium-vanadium steels that are suitable for most applications where low-alloy, high-strength steels are required. The carbon-vanadium steel is compared with plain-carbon steel; and the chromium-vanadium steel, with chromium-molybdenum steel. Note the excellent properties of the vanadium-bearing steels.

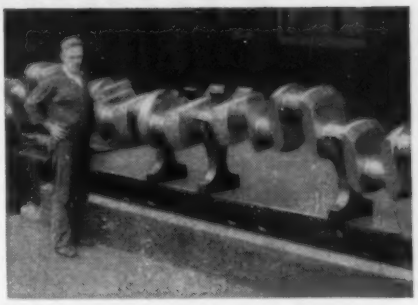

Fig. 1 — Vanadium increases the strength, toughness, and wear resistance of engineering steels for many machine parts, such as this large crankshaft.

Improves Cast Iron

A small addition of vanadium, usually from 0.10 to 0.25 per cent, refines the grain of cast iron, and materially increases its strength and hardness. Moreover, vanadium may be used in cast iron to replace at least part, if not all, of certain alloys that are now in short supply.

Vanadium in Rimmed Steel

An addition of approximately 1 lb. of vanadium per ton of steel produces non-aging characteristics in a rimmed steel. These non-aging properties, together with improved deep-drawing characteristics and the good surface inherent in rimmed steels, make these steels of particular interest at the present time.

Grades of Ferrovanadium

ELECTROMET produces ferrovanadium containing 50 to 55 per cent vanadium for the production of vanadium-bearing steels and irons. The alloy is produced in three grades with maximum 0.20, 0.50, or 3.00 per cent carbon and maximum 1.50, 2.00, and 8.00 per cent silicon, respectively. Each grade is specially adapted to fill the different requirements of iron- and steel-making.

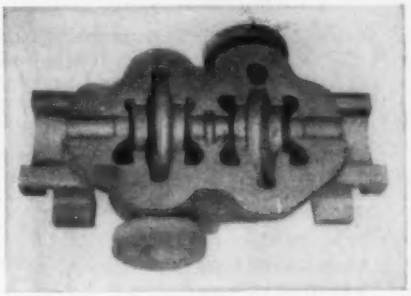

Fig. 2—Steel and iron castings treated with small additions of vanadium have high ductility and greater toughness and impact resistance.

Write for a copy of the booklet, "ELECTROMET Ferro-Alloys and Metals," which gives helpful information about the use of ferrovanadium and other alloying metals that ELECTROMET supplies. The booklet may be obtained from any ELECTROMET office: in Birmingham, Chicago, Cleveland, Detroit, Los Angeles, New York, Pittsburgh, or San Francisco. In Canada: Welland, Ontario.

Properties of Vanadium Steels Compared With Other Engineering Steels

Typical Analysis, %	Carbon Steel	Carbon-Vanadium Steel	Chromium-Molybdenum Steel	Chromium-Vanadium Steel
Vanadium	—	0.16	—	0.16
Carbon	0.50	0.49	0.50	0.50
Manganese	0.71	0.77	0.80	0.79
Silicon	0.19	0.15	0.30	0.31
Chromium	—	—	0.95	0.98
Molybdenum	—	—	0.20	—
Annealed and Furnace-Cooled				
Tensile Strength, psi	90,600	100,000	100,000	99,500
Yield Point, psi	48,900	66,000	50,000	64,100
Elongation in 2 in., %	23.3	25.0	23.0	28.4
Reduction of Area, %	37.8	49.1	45.0	59.0
Izod Impact, ft.-lb.	13.5	26.0	17.0	44.0
Quenched and Tempered				
Tensile Strength, psi	134,900	134,500	232,000	232,800
Yield Point, psi	110,800	128,000	214,500	224,200
Elongation in 2 in., %	18.3	18.3	10.0	10.4
Reduction of Area, %	54.1	56.6	39.0	43.1
Izod Impact, ft.-lb.	54.0	65.0	12.0	12.0

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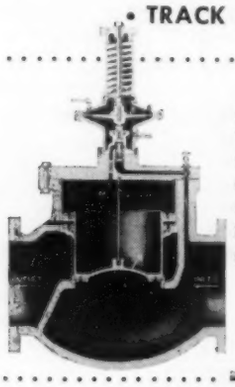
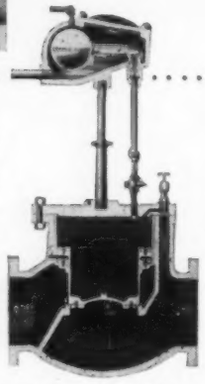


ALTITUDE CONTROL VALVE—Available with electrical attachment to permit emergency closing from remote control station.



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Our descriptive bulletins will interest you.

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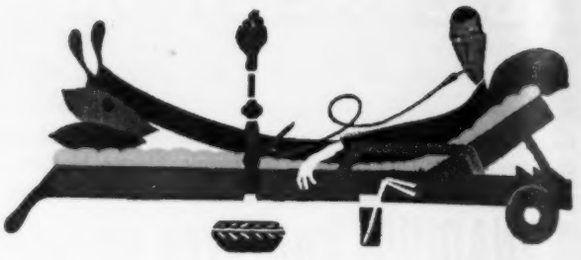


Fatigue Cracks

by Charles T. Post

Solid Comfort

It's part of the newsman's code never to reveal sources, so we can't tell how we found out, but—in the swank New York skyscraper being built to house the U.S. headquarters of an internationally known manufacturer of household products, the board chairman's private bathroom will have special equipment.

Specifications call for the seat to be upholstered, with adjustable arms and backrest. After all, we are told, an executive must act like an executive at all times.

Dagmar

It's some weeks ago now that Eutectic Welding Alloys Corp. sent us this picture of Dagmar, but until she popped up, so to speak, on the front cover of *Life*, we never were sure she belonged in a family magazine like your f.f.j. Might give the kiddies the wrong idea.

We might as well let you know now that the graduate welders out at Eutectic chose her as the "girl we would most like to weld with." Reason? "To insure maximum speed in production for defense." According to Eutectic, she was chosen for her "outstanding qualities of beauty, physical charm, poise, determination, endurance, meticulousness, emotional stability, ready wit and unselfishness."

The only thing that bothers us is whether she can really weld.

Tied Up

Wolverine Tube Division is sending a set of shoestrings to each of its customers with these instructions: "String Along With Wolverine. A lot of people are beating a path to our door these days for copper tubing. But . . . as you well know . . . defense work and stockpiling have supplies all tied up. Remember: we are doing our best for you." With that thought, we wouldn't mind a bit using up a lot of shoe leather looking for tubing.

Puzzlers

Two more answers about Farmer Jones' livestock from M. L. Ross, DuPont, and L. Schechtman, Handy Button Machine Co. and one on the triangle problem from J. W. Mecklenburger, Brasco Mfg. Co.

The ages of Mr. Ludwig's family are now known by J. A. Davenport, Cincinnati, W. Blasnick, Jacoby-Bender, Inc., B. H. Pass, Rochester Iron & Metal Co., C. J. Sisto, Central Iron & Steel Co., R. W. Huff, Canton, Ohio, and R. R. Savage, Du Page Boiler Works, Inc.

Richard Knibloe, Bethlehem Steel Co., thinks he has one that will keep you busy these hot days. Use each of the digits 0-1-2-3-4-5-6-7-8-9 once and only once to make whole numbers, decimals or fractions which add up to exactly 100.

machine tool high spots

sales inquiries and production

by George Elwers

Machine Tools First—Super priorities, financial assistance, and manpower help were asked for the machine tool industry by its advisory committee meeting with the NPA last week. It voiced again a complaint about the profit-controlling GOR 15, issued as the supposed answer to the machine tool industry's price problems.

Right now no priorities, except when special directives are issued, have precedence over others. But since steel and other scarce materials can't be processed by defense contractors unless they have machine tools, the machine tool industry f e e l s its requirements should come first.

Financial Aid—At the meeting the financial distress of many machine tool builders was emphasized and a request for government aid was made. This request has been covered to a certain extent by the recent government offer of 30 pct down payment to those holding pool orders.

But attractiveness of this offer was diminished by the requirement that the builder pay 4 pct interest on the money thus obtained. And, proof that the money could not have been borrowed by a bank must be provided by the builder.

Labor Hoarding—Help in securing and holding skilled labor was also an urgent matter brought up at the meeting. It was suggested that labor piracy might be cut down by a clause in government contracts prohibiting defense contractors from hiring labor drawn from machine tool builders.

There is considerable evidence that labor is being "stockpiled"—hired well in advance of need—by the big defense plants. This practice, of course, contributes to the already serious shortage of skilled manpower in machine tool plants. Workers who left machine tool plants to get higher wages in new defense plants have found the machines they were to operate not yet installed. Sometimes they are put to work as instructors, but often their skill is wasted on menial work or no work at all other than to "look busy when the brass comes around." A few cases have been reported where workers have quit in disgust and gone back to their previous jobs.

Hidden Joker? — Another apparent joker in the new machine tool price order, GOR 15, has come to light. The order provides that all assets acquired after Jan. 1, 1950, be depreciated at normal rates.

This apparently means that, for purposes of figuring rate of return, builders cannot take advantage of accelerated depreciation provided by certificates of necessity.

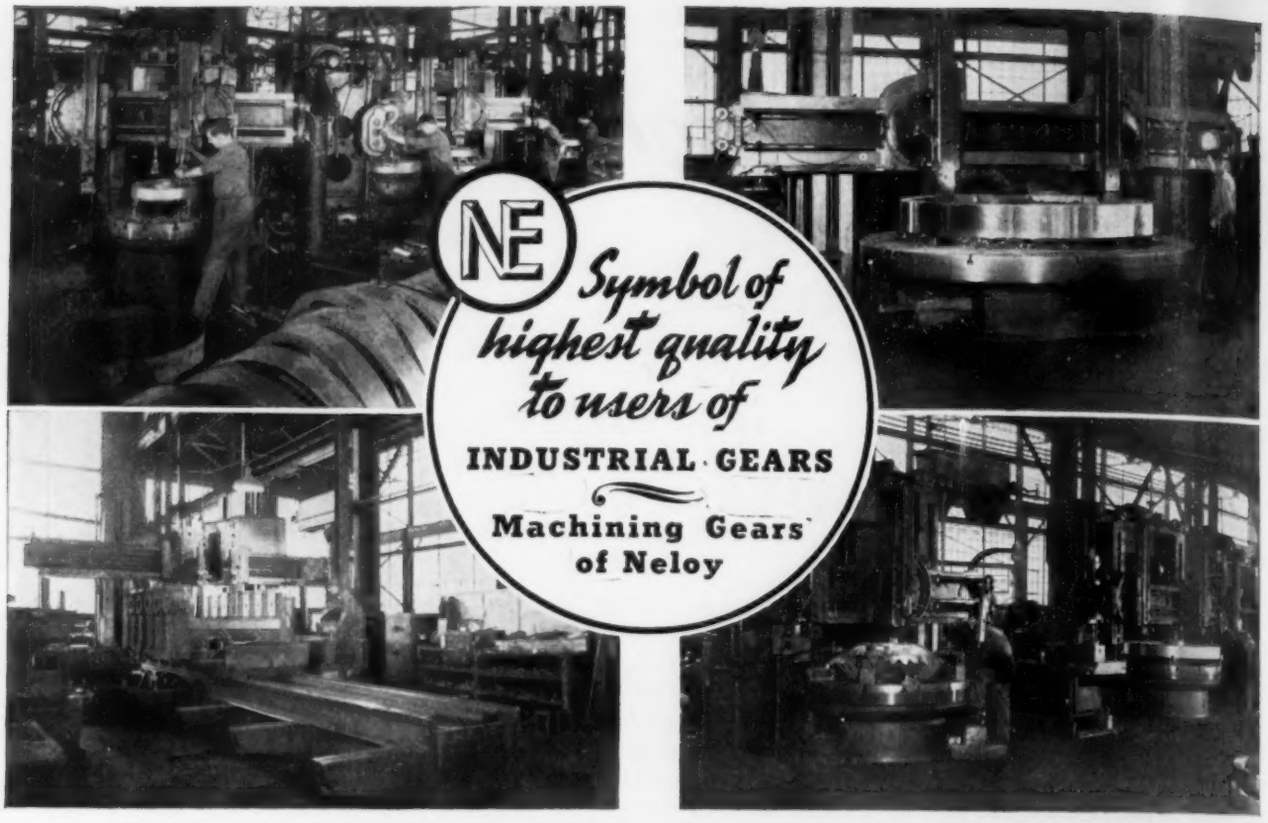
Delivery Preference—There are indications that some sort of plan for assigning preference for delivery among machine tools for defense industries is being cooked up in Washington. Such a plan would see that first things come first, instead of the present situation where generally machine tools are delivered in the order in which orders were placed, regardless of the relative urgency of the projects for which they are destined.

Theoretically some precedence among various orders is established by the required dates for d e l i v e r y which manufacturers specify. But in practice these dates usually bear little relation to the actual date on which they will be needed. One builder, after being continually hounded for delivery of two machines to a new defense plant, finally shipped them on about the promised date, and sent along men to assist in the installation. The men returned the next day. Foundations for the machines weren't yet ready.

June Order Rise—Preliminary figures from the National Machine Tool Builders' Assn. show the index of new orders rose to 567 in June, higher than May but lower than the figures for February and March.

Shipments, which have been rising steadily since Korea, reached an index value of 183.5. Despite all the troubles besetting the industry, this figure is twice the rate of shipments of June 1950.

By way of comparison, the shipments index stood at 113.1 at this time in 1950, and 62.5 in 1949.



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Besides eliminating the total loss of scrapping a worn forging die, rebuilding dies with HASTELLOY alloy C frequently makes them last longer than new ones. Most shops have found that repaired dies last 2 to 3 times longer than the original metal. Also, when a reclaimed die finally does wear, it can be machined and faced again.

HASTELLOY Alloy C Is Easy To Apply:

Alloy C rod can be easily applied to the worn contour and part lines of old forging dies. Preheating is seldom necessary except to speed welding of very large dies. The rod can be applied to any of the common die steels by arc welding.

Deposits Are Machinable:

When deposited, HASTELLOY alloy C has a hardness of about 200 Brinell. It can be machined by any of the common diesinking tools. Grinding is not necessary.

Peening Is Eliminated:

There is no need to peen or hammer a HASTELLOY alloy C deposit. Deposits work-harden in service to from 325 to 375 Brinell and have excellent resistance to chipping and spalling.

For further information on rebuilding worn forging dies, get in touch with the nearest Haynes Stellite Company district office. Ask for a copy of the new "Haynes Hard-Facing Manual," which tells how to apply HASTELLOY alloy C and many other HAYNES hard-facing rods.

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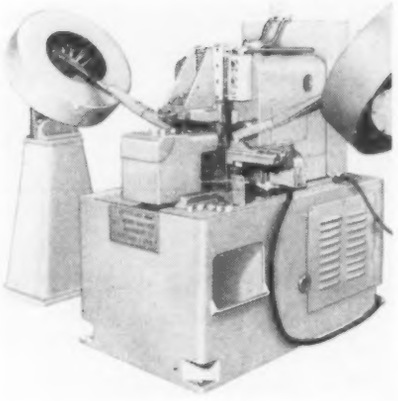

Cam automatic turns small electric motor rotors

This cam automatic forming machine turns the OD and chamfers one end of laminated silicon steel motor rotors. Varied lengths of any one diameter can be handled. In operation cam-actuated loading mandrels automatically locate in the center hole of each piece and force the piece against the hardened drive spurs mounted on the face of each spindle, while the magazine slides retract and reload. The tool slide rapid advances downward to position and feeds horizontally across the diameter of the work. It is then withdrawn to dwell position where a second tool chamfers the trailing edge of the piece. Cam automatics can be furnished with hopper or magazine feed. All machine functions are mechanically controlled by one main camshaft. *Motch & Merryweather Machinery Co.*

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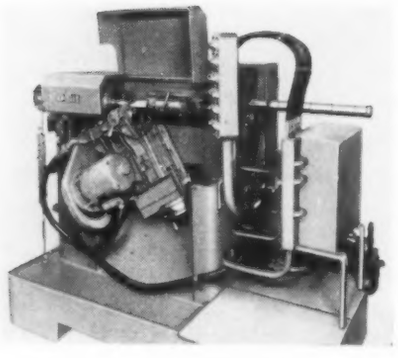

Standard machine grinds jet compressor blades

The machining cycle on a precision profile grinder is automatic except for loading and unloading the work and pressing the cycle button. The machine grinds the complete airfoil form including leading and trailing edges. As the work rotates it moves lengthwise across the grinding wheel at an adjustable rate of feed. A two-speed work drive motor slows down while the grinding wheel cuts the broad sides of the blades, then speeds up while the narrow edges are being ground. Precision grinding spindles are available for any speed required and for any practical wheel size. The grinding wheel is dressed with a hand operated, swivel type diamond dresser. *Ex-Cell-O Corp.*

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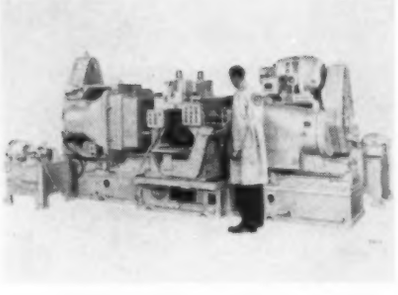

Machine taps holes in automotive cylinder blocks

Forty-seven holes in 20 automotive cylinder blocks per hr can be tapped on a new two-way horizontal Holetapper. All operations are automatic as follows: Left hand head taps 11 holes to ¾ in. pipe tap; taps 4 holes to ⅛ in. pipe tap; taps 2 holes to 5/16 in. pipe tap; 5 holes to ⅜ in.-16 tap; and 1 hole to ⅜ in. N.P.T. The right hand head taps 13 holes to 7/16 in.-14 tap; taps 6 holes to ¾ in. pipe tap; taps 4 holes to ½ in.-13 tap; taps 1 hole to ⅛ in. pipe tap. *National Automatic Tool Co.*

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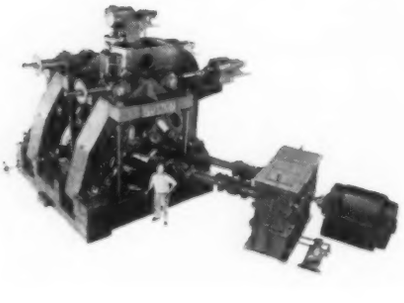

Tube and bar straightener requires no guides

Tubes 4½ to 16½ in. OD and solid bars from 4½ to 9 in. diam can be straightened on this new KTC straightener. Seven straightening rolls are employed, in two groups of three and a middle idler roll that deflects the pipe during the straightening operation. The roll arrangement eliminates the use of all guides and positively confines the bar or tube to the pass line throughout the straightening operation. Straightening speeds are 60 to 240 fpm using a 200 hp dc motor. *Sutton Engineering Co.*

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Turn to Page 36

FREE *publications*

These publications describe money-saving equipment and services... they are free with no obligation... just fiill in and mail the postcard.

Cold strip mill

A new Y-type reversing cold strip mill is described in a new 16-p. booklet. The new mill is available in widths from 16 in. up for the cold-rolling of all grades of steel and nonferrous metals. The Y-type roll arrangement uses small diameter rolls in a compact, rigid housing. Greater penetrating ability and accuracy of finished gage are claimed for the mill. *Mackintosh-Hemphill Co.*

For free copy insert No. 28 on postcard

Soaking pits

A new type soaking pit which heats more steel uniformly with less fuel is described in a recent folder. Designers claim the equipment may be operated with lower maintenance cost and greater yield per ton. The unit is equipped with cycle timer, tool combustion system, low-stress, high-heat recuperator and completely automatic dual combustion system. *Loftus Engineering Corp.*

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Corrosion control

Control of return line corrosion with Dearborn's corrective treatments are described in a new 4-p. folder. Test procedures for Formula 700, which dissolves in the condensate and reacts with CO_2, preventing carbonic acid, and the new filming type amine, Formula 702, which forms a continuous film in return lines, coating them against both oxygen and CO_2 corrosion. *Dearborn Chemical Co.*

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Shear selector chart

A convenient shear selector chart which greatly simplifies choice of the correct rotary shear knife in shearing operations has been prepared by Simonds Saw and Steel Co. Use of this chart which can be hung beside the slitting machine will save time in setup. *Simonds Saw and Steel Co.*

For free copy insert No. 31 on postcard

Alloy centers

Greater resistance to wear, heat and abrasion are offered by the Gorham line of M-40-U alloy lathe centers. A solid core of the tough alloy permits more production between clean-up grinds and reduces machine down-time. *Gorham Tool Co.*

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Turn to Page 133

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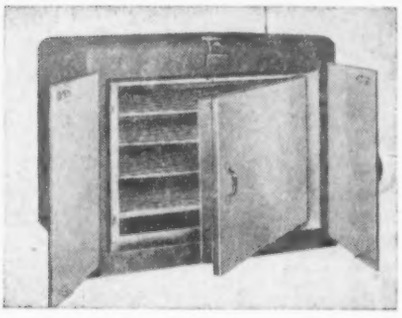
new equipment

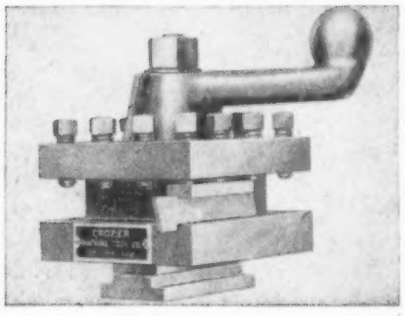
Continued



Portable electric oven with temperature to 800°F

For processing at higher temperatures such as required for stress relief of springs and plated parts, a new low-priced portable electric oven features uniform temperature throughout. Construction permits the nesting of one oven on top of another. They can be used in groups or banks and can be operated individually or selected ovens in the group can be cut-out or heated at different temperatures. Temperature range is 100° to 800°F. The ovens are heavy gage steel with Fiberglas insulation. They operate from any 110 v outlet. *Grieve-Henry Co.*

For more data insert No. 5 on postcard



Tool post turret has 12 position index feature

The turret may be aligned with the work with the compound rest of the lathe set at any 30° increment. This feature is said to increase further the speed and efficiency of bench, engine and turret lathe operation. The Crozier tool post turret comes with a cut-off tool and holder as standard equipment. Both may be removed to allow the use of four regular tools. Three sizes are available: 5⅝, 4 and 3-in. square. All are made from hardened steel. *Crozier Machine Tool Co.*

For more data insert No. 6 on postcard

Electrical tape

The adhesive on a new Koroseal electrical tape is non-transferring and can be pressed onto a dry surface innumerable times without losing its stickiness. It will not transfer the adhesive from the face, lose its tackiness, or ability to adhere, and will stick snugly and securely to itself and insulation around copper wire. The tape has a dielectric strength of 8000 v, is waterproof, abrasion resistant and flameproof, resistant to acids, oil, alkalies and corrosive salts. It stretches and conforms readily to irregular surfaces. *B. F. Goodrich Co.*

For more data insert No. 7 on postcard

Hardening casting resins

Casting resins are said to be hardened without heat at room temperature in a matter of minutes by using Quick-Set, a new liquid accelerator. This permits the production of master models, duplicating and foundry patterns, jigs and fixtures in record time. When added to 8000 Tool-Plastic mix the formula eliminates the use of ovens and overnight hardening. Control of hardening time is possible through the amount of Quick-Set used. *Rezolin, Inc.*

For more data insert No. 8 on postcard

Turn to Page 38

use postcard below

Postcard valid for 8 weeks only. Information may be secured subsequently by separate letters fully describing each item wanted, including company name.

ostcard valid 8 weeks only. See above. 8/2/51
lame .....
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o. Address .....
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HE IRON AGE, New York 17

Fill in above the number of the item on which you need further data.

Postcard valid 8 weeks only. See above. 8/2/51
Name .....
Title .....
Company .....
Co. Address .....
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THE IRON AGE, New York 17

Fill in above the number of the item on which you need further data.

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HE IRON AGE, New York 17

Fill in above the number of the item on which you need further data.

Postcard valid 8 weeks only. See above. 8/2/51
Name .....
Title .....
Company .....
Co. Address .....
.....
THE IRON AGE, New York 17

Fill in above the number of the item on which you need further data.

FIRST CLASS
PERMIT No. 36
(Sec. 34.9 P.L.&R.)
New York, N. Y.

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No postage necessary if mailed in the United States

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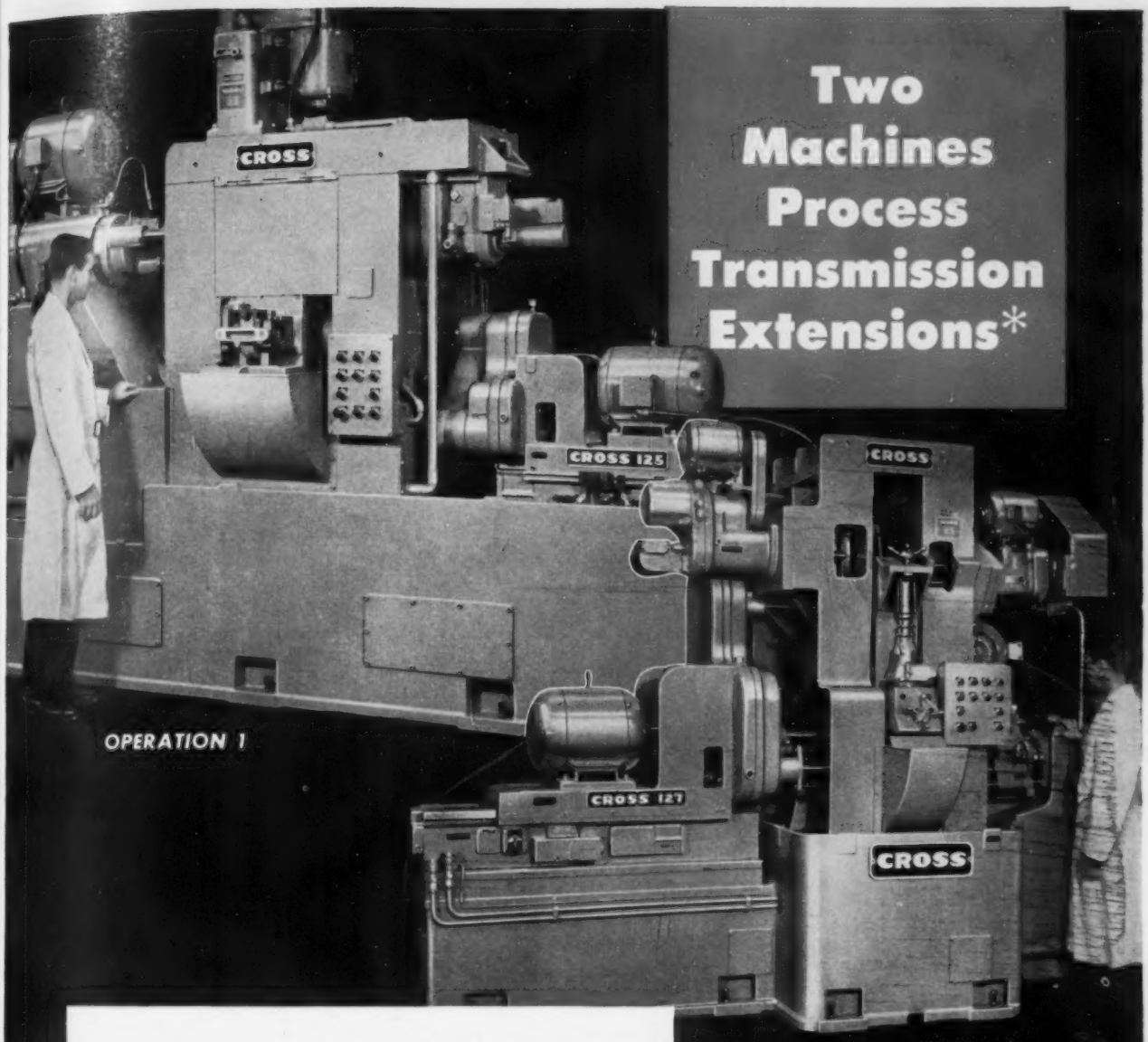


Two Machines Process Transmission Extensions*

OPERATION 1

OPERATION 2

- ★ Operation 1: bore both ends; face large end; ream flange holes in large end; oil groove small end; chamfer and tap two holes in mounting flange.
- ★ Operation 2: mill mounting flange; drill, bore, chamfer and tap speedometer hole complete; drill, chamfer and tap two inspection cover holes.
- ★ 125 pieces per hour at 100%.
- ★ Features: J.I.C. standard construction; power operated indexing trunnions; fluid motor drive for indexing; single point tool for cross-facing flange of large end.

Except for finish bore

Established 1898

THE CROSS CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS

new equipment

Continued

Bandsaw has large work capacity, extended speed range

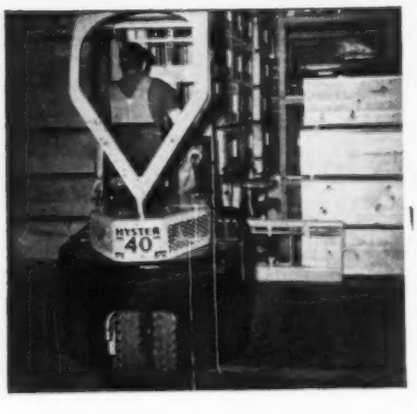
Design flexibility adapts this large work capacity and extended speed range bandsawing machine to specialized production sawing applications. Standard drive and feed components are combined in the 60-in. throat frame to provide maximum machining versatility. The welding unit joins and anneals all band widths up to 2 in. It includes motorized grinder and blade squaring shear. The job selector dials cover blade, speed and feed recommendations for all types of materials over the machine's tool speed range of 40 to 10,000 fpm. This speed range is handwheel controlled through a three-speed transmission and variable pitch diameter Speedmaster drive. For straight power feeding to assure perfectly straight vertical cuts, the 16-in. stroke hydraulically powered work table is used. Table tilts 45° right, 10° left for angular cuts and beveling operations. The machine is powered by a 7½ hp motor; it can cut any type material. *DoAll Co.*

For more data insert No. 9 on postcard, p. 35

Working height lifter controlled by pedal switches

This new piece of positioning equipment keeps the work at convenient working height, eliminating unnecessary lost time and reducing operator fatigue and danger of injury. Lifting, stopping and lowering of the load are controlled by remote pedal switches that can be conveniently located since they are mounted on a single steel plate at the end of a 15 ft heavy duty rubber electrical cord. The lifter is made in 4000-lb capacity, 42 in. lifting height, 72 in. overall height, in platform lengths of 36, 42, 48 and 54 in. x 32 or 38 in. wide. The pan type platform lowers to the floor so that unit loads on skid platforms or pallets can be placed on the lifter by a regular lift truck. The platform can be locked at various heights and the entire lifter moved by lift truck. *Lewis-Shepard Products, Inc.*

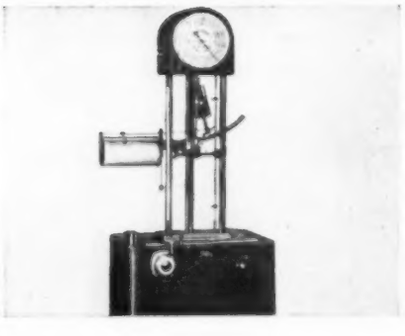
For more data insert No. 10 on postcard, p. 35



Effortless steering possible by improved wheel design

Easier steering, further reducing operator fatigue with resultant increase in materials handling has been made possible by an improved wheel design on the Hyster Model YT-40 (4000-lb capacity) fork lift truck. Trucks are equipped with dual wheels instead of a single wheel on the steering trunnion. Single-wheel type Model 40s can be converted with a minimum of alteration. The new design also has reduced the gear ratio in the steering mechanism from 31:1 to 20.7:1, requiring only seven turns of the steering wheel to swing the trunnion 120°. Pneumatic tire size has been reduced for interchange with Model 20 lift truck. *Hyster Co.*

For more data insert No. 11 on postcard, p. 35



Improved low-range tester tests heavier material

A 0 to 300-lb scale that is suitable for testing heavier materials has been added to the Dillon low-range tester. An improved motor drive is standard equipment and assures full torque up to 300 lb direct loading and with stepless speed control operable from 0 to 20 ipm. A solid shaft now connects the speed control to the motor transmission. The speed control dial is mounted on top of the tester base for greater ease in reading and adjusting settings. Test may be conducted in tensile, compression, transverse or shear. *W. C. Dillon & Co.*

For more data insert No. 12 on postcard, p. 35

Turn to Page 126

Here comes Aluminum

The amount of electricity it takes to produce one ton of aluminum is enough to light your house for 15 years! Thus aluminum production takes a lot of water power.

The torrent above is a view of the mighty Saguenay River, which turns the turbines of the 1,500,000-horsepower Shipshaw hydroelectric plant that supplies power for the Aluminum Company of Canada—one of the world's great aluminum producers.

Alcan, as most of us in the business call it, is one of the Aluminium Limited companies, whose products we distribute.

Utilizing great power resources and modern production facilities, we are supplying millions of pounds of aluminum which are being employed to strengthen transportation, essential industry, and military security. At the same time, we are striving to relieve the shortage of aluminum for the thousands of other uses where its qualities are desirable—and desired.

ALUMINUM IMPORT CORPORATION

Distributing company, in the Western Hemisphere, of the **ALUMINIUM LIMITED** *group*

Offices and agents in 40 cities
620 Fifth Avenue, New York 20 Av. Ing. Luis A. Huergo 1279, Buenos Aires Rua Da Quitanda 96, Sao Paulo

Cable address: ALIMPORT

IRON AGE *introduces*

Robert F. Hodgson appointed sales manager of HYDRAULIC EQUIPMENT CO., Cleveland.

H. L. Henry, named divisional sales representative of Northern Ohio for the Hydraulic Machinery Div., WATSON-STILLMAN CO., Roselle, N. J.

R. F. Edgar, named midwestern district manager of the industrial division, WARNER ELECTRIC BRAKE & CLUTCH CO., Beloit, Wis. **Elton Moittel,** appointed field engineer with offices in Milwaukee, and **Roger H. Brown** was appointed eastern district manager.

George Libles joined the purchasing department of the ALTER CO., Davenport, Iowa.

Dr. Paul J. Whitaker, appointed industrial medical director for the West Allis works of ALLIS-CHALMERS MFG. CO.

E. K. Redfern, elected treasurer and director of EICHLEAY CORP., Pittsburgh.

H. H. Wunderlich, elected treasurer of JONES & LAUGHLIN STEEL CORP., Pittsburgh.

W. G. Dahl, appointed district manager, Hartford, Conn., territory, for the LATROBE ELECTRIC STEEL CO., Latrobe, Pa., replacing **H. C. Cole** who has resigned from the company.

Robert D. Turner, appointed secretary-treasurer, Marvel-Schebler Products Div. of BORG-WARNER CORP. at Decatur, Ill. **Donald N. Arndt,** appointed general sales manager.

William F. Jones, promoted to superintendent of the Boston plant of NATIONAL LEAD CO., succeeding **Herbert Shattuck** who has retired. **Harvey Morgan** has been named superintendent of the Buffalo plant.

C. S. White, appointed manager of the Eastern division of DEARBORN CHEMICAL CO., with headquarters in New York.

Herbert E. Gallison, appointed manager, industrial mixer sales division of WORTHINGTON PUMP & MACHINERY CORP., with headquarters at the Dunellen, N. J., plant, succeeding **J. C. Lukas** who has resigned.

W. H. Geib, appointed superintendent of the GLIDDEN CO. plant in Reading, Pa. **Robert Kempf** has been named assistant to Mr. Geib and **Walter Herner** has been transferred from San Francisco to Cleveland as assistant to general superintendent.

Clark A. Sutton, appointed plant manager; **J. Ross Maxwell,** appointed superintendent of the bar mill and **Malcolm C. Hulse** has been appointed superintendent of the tubing mill, Summerill Tubing Co. Div., of COLUMBIA STEEL & SHAFTING CO.

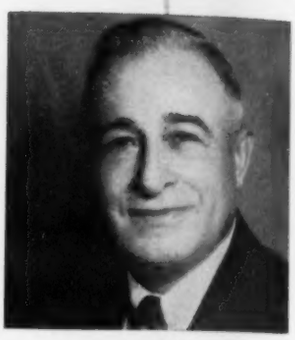
Ralph J. Morgan, promoted to executive assistant to the president of the CATERPILLAR TRACTOR CO., Peoria, Ill. Others promoted: **Clyde L. Schwyhart** was named manager of the newly named education and training department, and **Fred R. Jolly** was made manager of the community relations department.

R. G. Sullivan, heads the West Coast operations of REEVES PULLEY CO., Columbus, Ohio.

Albert R. Pfeltz, Jr., appointed assistant manager of sales in U. S. STEEL CO.'s Cincinnati district sales office.

Gordon H. Bannerman, in charge of the Tramway Div. of COLUMBIA STEEL CO., San Francisco.

Turn to page 70



A. H. BORCHARDT, elected a vice-president of Worthington Pump & Machinery Corp., Harrison, N. J.

LEONARD J. FLETCHER, elected a vice-president of Caterpillar Tractor Co., Peoria, Ill.

HAROLD A. MILLER, appointed general staff manager, general sales department, U. S. Steel Supply Co., Chicago.

IRON AGE

salutes

Ralph L. Wilson

RALPH WILSON is the "man of distinction" in Canton this month. His friends are always kidding him about his distinguished appearance—and now he's been chosen vice-president of American Society for Metals.

It's a wise choice. Also a natural one. Years of outstanding service have given him high stature among our foremost metallurgists.

Ralph still probably studies harder on metallurgy and allied subjects than the average college student on his entire curriculum. He has a habit of hibernating in his study for hours on end. And it's strewn with all sorts of technical books.

Despite his concentrated work and study, his interests have remained broad. One of his favorite hobbies is gardening—not vegetables, but flowers and shrubs. His love for sports dates back to his days on the Lehigh wrestling team. Still an avid Lehigh fan, he got a big bang out of their undefeated football season last year. He likes art, collects paintings, is a member of National Art Institute.

After graduating from Lehigh in 1922 he started as metallurgist with United Alloy Steel Corp. (now Republic). In 1928 he joined Timken Steel and Tube Div. as metallurgical engineer and soon became well known in the field of high temperature applications. In 1938 he went to Climax Molybdenum Co. where he worked on development of new uses for molybdenum.

During the War he was loaned to the government as consultant and rose to head the section on Engineering Alloy Steels, Steel Div., WPB. Back to Timken in 1944 as Chief Metallurgical Engineer, he was later appointed Director of Metallurgy for all divisions, the job he now holds.

FRANK J. BYRNE, appointed assistant manager of sales, steel strapping division, Brainard Steel Co., Warren, Ohio.

OTTO H. ROSENTRETER, appointed general manager of the newly formed corporation, Inesco, Inc., Los Angeles.

WALTER T. MORELAND, elected vice-president in charge of sales of Lone Star Steel Co., Dallas.

WALLACE M. LOOS, named manager of mill products for the Carpenter Steel Co., Reading, Pa.

IRON AGE *introduces*

Continued

Edison C. Sickman, appointed general sales manager of the ATLAS MINERAL PRODUCTS CO. Mertztown, Pa. Other appointments: **Donald F. Deakin** and **Gerald F. Gilbert, Jr.,** will assist Mr. Sickman in sales department activities. **Earl A. Erich** will handle technical service activities. **George Gabriel** has assumed the additional duties of plant manager and **George Kanelis** was promoted to assistant plant manager along with **Raymond Trollinger.**

William Townsend, advanced to vice-president of the PENNSYLVANIA FLEXIBLE METALLIC TUBING CO., Philadelphia. Others elected: **Charles W. Strine,** treasurer; **Charles W. Young,** vice president in charge of production; **Emil Haegele,** master mechanic, and **C. Maxwell Peterson** was elected to the board of directors.

Ben F. Sweet, in charge of the expansion and modernization of the gray iron and white iron foundries of SPROUT, WALDRON & CO., INC.

George I. Ziders, appointed plant industrial engineer of the Sanderson-Halcomb Works, CRUCIBLE STEEL CO. OF AMERICA, Syracuse, N. Y.

John G. Sauer, placed in charge of sales of magnesium castings, Litchfield, Ill. plant of AMERICAN RADIATOR & STANDARD SANITARY CORP.

John B. Connally, Jr., elected a member of the board of directors of LONE STAR STEEL CO., Dallas.

Ellen G. Ingalls, named president and chairman of the board of INGALLS IRON WORKS CO., chairman of the board of INGALLS SHIPBUILDING CORP., and president of STEEL CONSTRUCTION CO. **M. F. Pixton** was named chief executive officer; **W. R. Guest, K. H. Gayle, Jr.,** and **R. C. Palmer** were named vice-presidents of the iron works, and **D. W. Strickland** was named general counsel for the company.

Harold A. Brossman, assumes the responsibilities of manager of stainless steel sales of the CARPENTER STEEL CO., Reading, Pa. **Howard M. Goodman** succeeds Mr. Brossman as manager of alloy steel sales, and **Robert F. Koch** was promoted to assistant manager of stainless steel sales.

Thomas E. Wilson, named production manager, GMC Truck & Coach Div., GENERAL MOTORS CORP., Birmingham, Mich. **Earl A. Maxwell** was named to succeed Mr. Wilson as director of personnel.

William K. McGreevy, appointed sales representative, Pittsburgh regional office, Philadelphia Div., YALE & TOWNE MFG. CO.

Leo Martin and **Jim Hull,** joined the staff of FLEXIBLE TUBING CORP., Branford, Conn. Mr. Martin will be design engineer in charge of the machine development and design laboratory and Mr. Hull becomes chief of the chemical laboratory and development section.

William E. Saupe, appointed operation manager, and **Will Pruessman** was named manager manufacturing, Schenectady steam turbine and generator division, GENERAL ELECTRIC CO.

Henry T. Blandford, appointed chief cost accountant, LIQUID CARBONIC CORP., Chicago.

Joseph N. Ryder, appointed sales manager of the UNITED MFG. CO., Bedford, Ohio.

A. R. Booker, named executive vice-president and general manager of ELECTROFILM CORP., Los Angeles.

William A. Mallory, named manager of the mechanical connectors department for NATIONAL ELECTRIC PRODUCTS CORP., Pittsburgh.

John F. McLean, Jr., appointed special assistant service manager, service department, Ford Div., FORD MOTOR CO., Dearborn, Mich. **John S. Snyder,** appointed manager of the truck sales section and **Irving L. Pierce** becomes assistant fleet sales manager.

W. C. Spruce, promoted to Southwest district manager for D. E. VILBISS CO., Dallas.

Henry D. Phillips, elected president of the HARTFORD ELECTRIC STEEL CORP., Hartford, Conn.

E. L. Miller, elected to the board of directors of AMERICAN VITRIFIED PRODUCTS CO., Cleveland. **J. L. Brown** was elected vice-president.

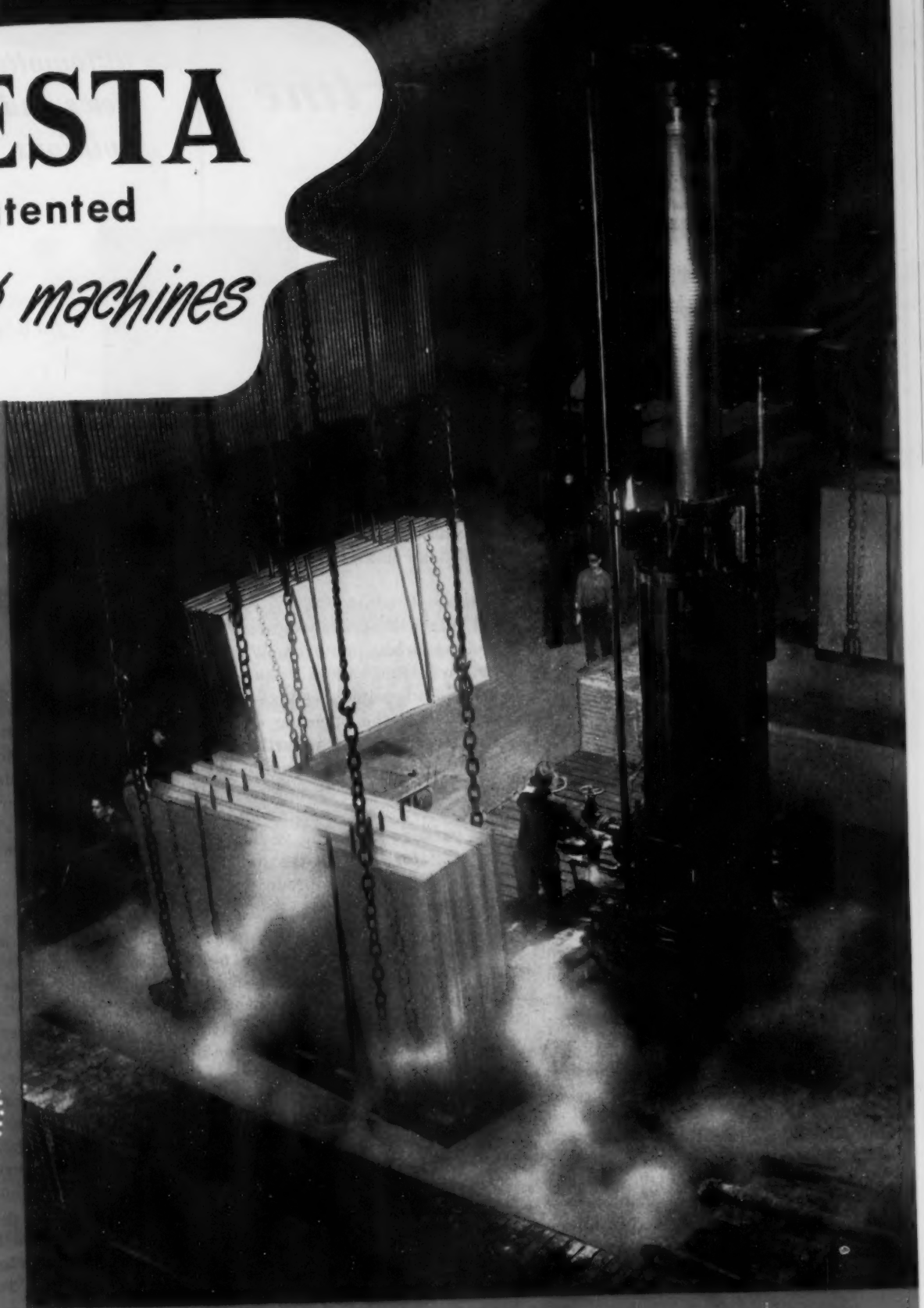
Robert N. Nelson, appointed assistant sales manager, pneumatic division, SUNSTRAND MACHINE TOOL CO., Rockford, Ill.

James F. Jones, appointed factory manager of the HUDSON MOTOR CAR CO., Dearborn, Mich.

MESTA

patented

pickling machines



DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

MESTA MACHINE COMPANY

PITTSBURGH, PA.

on the assembly line

automotive news and opinions

Relief of automotive steel shortage in near future not likely . . . Wheel steel tighter . . . Detroit and machine tools.

by Walter G. Patton

No Relief—There are many reasons why the steel bottleneck now facing the automobile industry is not likely to clear itself in the near future.

First and foremost, there is a basic shortage of metallics. Recent critical developments in scrap will aggravate this shortage.

Wheel Steel Short—Despite cutbacks of 60,000 units per week in auto assemblies as compared with a year ago, demand for steel is still high. Steel inventories are badly balanced. Steel consumption is exceeding steel delivered in many classifications.

During the past week a critical situation in wheel steel developed. The bar steel picture is hectic. This applies particularly to alloy bars which, with copper, are two of the tightest spots in the materials flow line.

History Repeats?—The demand for bars, particularly in the larger sizes, skyrocketed during the last war. The percentage of alloy steel increased from a normal 7 to approximately 20 pct. Plate requirements also soared because of the demands for ships, railroad cars, tanks and armored vehicles.

As time rolls by, it is becoming increasingly clear that the upside-down economics of war are going to place a terrific strain on the steel production pattern — even assuming scrap is available and new facilities come in on schedule.

Upset Product Mix—Steel product mix will be badly upset. Controlling production from Washington will add additional strains.

Even now some steel experts fail to see how the opposing demands of a peacetime and a wartime steel economy can be met simultaneously without ruinous compromise to both sides. This explains in part the paradox that the country is starving for steel in the midst of the most bountiful production of all times.

What's the Sense?—Walter Reuther's proposed plan for manufacturing machine tools has received little help from his rival unionist, Matthew Smith, national secretary, Mechanics' Educational Society of America, and a bitter Reuther rival. According to Smith, Reuther's plan of having castings, forgings, spindles, bearings, etc., made by mass production methods in widely separated plants all over the nation and then assembled in some central plant, makes no practical sense.

"Any machine tool man can tell the UAW braintrust that forgings, castings, bearings, spindles, etc., are already manufactured by mass production by companies specialized in these fields," Smith snorted. He asserted a high percentage of machine tools are made to the customer's own specifications, making large scale production inadvisable.

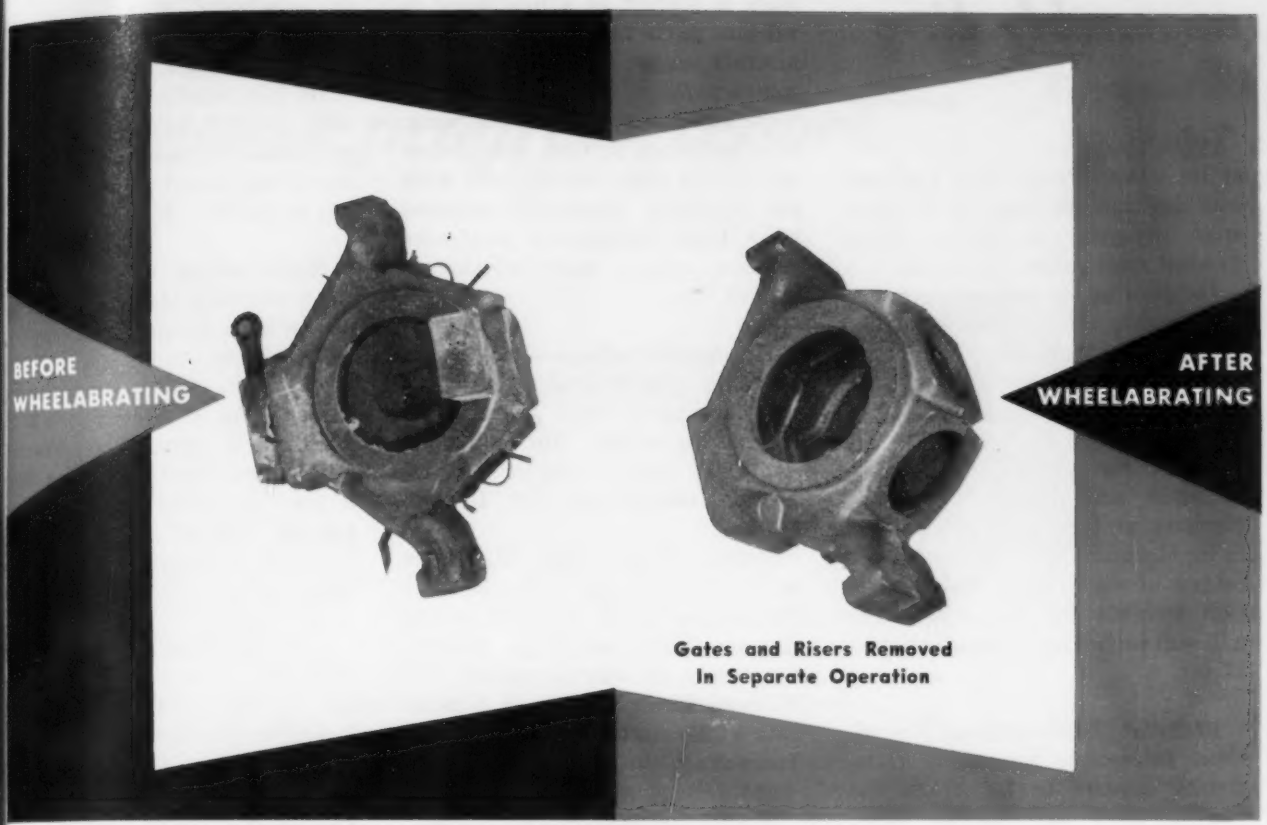
Specialized Tools — Here are some significant facts in the situation: (1) Most automobile engine tooling—and this may be the bulk of all machine tool investment—is specialized and not available to war production. This group includes the huge transfer machines for engine blocks, specialized equipment for crankshafts, camshafts, etc. (2) Auto tool room equipment which might be used for subcontracting work is usually tied up with work on jigs, fixtures and maintenance. (3) Small tool shops probably offer the best opportunity to subcontract machine tool work.

However, under existing circumstances the machine tool industry is not favorably inclined toward subcontracting. Also, the inherent difficulties of placing work in hundreds of small shops, many of them relatively unknown, raises another understandable obstacle.

Undoubtedly, the automobile industry will have to step into the picture boldly to break the machine tool tight spot. Just how this can be done is not now evident.

Ford Expansion—A modernization and expansion of its steel operation costing $43,000,000 has been announced by Ford Motor Co.

Turn Page



cleaning time cut 15,000 man hours yearly

WITH WHEELABRATOR® AIRLESS BLAST CLEANING

SUPERIOR FOUNDRY, INC. OF CLEVELAND, OHIO, reduced cleaning time from 96 to 40 man hours daily by installing a Wheelabrator Monorail Cabinet which handles all work formerly done by 3 tumbling mills and 2 blast tables.

INVESTMENT RETURNS 50% YEARLY. Half the cost of this equipment was returned the first year through savings effected in manpower, reduced maintenance, decreased storage space, power costs and increased cleaning room efficiency.

75% LESS MAINTENANCE. Maintenance of the former equipment required four men 8 hours a day. One man now does this work in 8 hours. In addition there has been a 40% saving in repair parts.

CLEANING QUALITY IMPROVED. Customers appreciate the improved appearance of the Wheelabrated castings which have a bright, silvery, uniform finish free of all sand and scale.

HERE'S HOW YOU CAN SAVE. An expert analysis of your cleaning problems by one of our engineers will give you complete facts needed to compare your present practice, or any other cleaning method, with the results you can get with the world-famed airless Wheelabrator. Why not take this action soon? Doing so may put thousands of dollars on the profit side of your business every year.

WHEELABRATOR — The perfected airless centrifugal blast unit pioneered by *American*. Slashes cost and cleaning time. Conserves power, labor, space. Cleaning perfection results in longer tool life, faster machining and grinding, easier inspection.

American
WHEELABRATOR & EQUIPMENT CORP.
510 S. Byrkit St., Mishawaka 3, Indiana

WORLD'S LARGEST BUILDER OF AIRLESS BLAST CLEANING EQUIPMENT

assembly line

Continued

at its Rouge Plant. The program will add 190,000 tons of finished steel capacity, increasing Ford finished steel output by 18 pct.

Included in the new program are 37 new coke ovens, a new sintering plant, new pig casting equipment and extensive improvements in the openhearth and rolling mill facilities.

Part of the coke used for the new facilities will supply the Ford Foundry at Cleveland. Alterations in its blooming mill will permit the rolling of slabs up to 60-in. wide. Coil weights for the cold-rolling mill will be increased an average of 87 pct.

Rockets Ahead—Among the various automobile companies, Oldsmobile appears to be off to the fastest start on defense work. Olds is now in volume production of bazooka rockets. Tooling is nearly complete for the production of tanks, cannon. Construction work is started on a new plant to produce parts for the Sapphire jet aircraft engine. Buick is the major contractor.

In addition to its defense work, Olds continues to turn out passenger cars in large volume. Last week the 750,000th Oldsmobile powered by a high compression 8-cylinder "Rocket" engine came off the assembly line.

His Qualifications—The job of breaking the aircraft bottleneck has once again been given to an automotive expert. He is Harold R. (Bill) Boyer, director of production engineering for General Motors.

During World War II, Boyer served for 2 years with the War Production Board as chief of the aircraft manufacturing branch. Previously, he was associated with Maxwell Motor Co. He is a graduate of Massachusetts Institute of Technology.

Shares Responsibility—As head of the Production Engineering Section of GM and a close associate of the late William S. Knudsen, Boyer's experience for his new job is excellent. A quiet, efficient worker himself, Boyer believes in delegating authority.

He has supplied effective leadership for the industry-wide standardization of machine tools and is known and highly respected by the entire machine tool industry.

Registrations Dip—Softness in the automotive market has been reflected by a sharp drop in new car registrations during June. The downward trend is contrary to usual seasonal gains. According to R. L. Polk & Co., statisticians for the automotive industry, during June a year ago new car registrations totaled 583,922. Polk's estimate for June 1951 is 440,000 registrations.

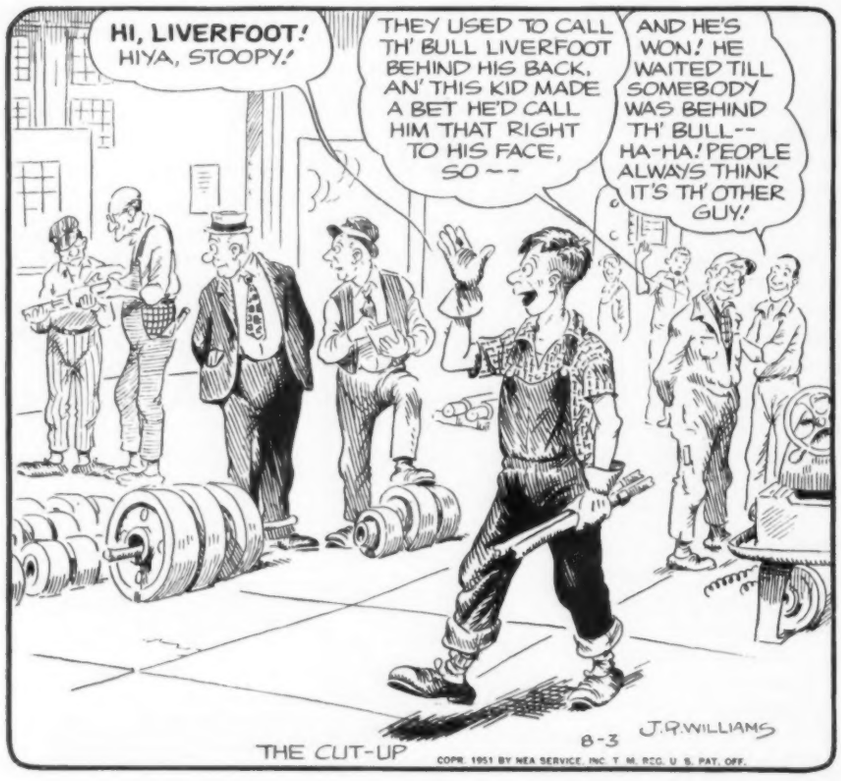
Cold Shoulder — Repercussions from the congressional investigation of contract awards by Detroit Ordnance Tank-Automotive center are coming thick and fast. Last week a $2,916,004 contract for tarpaulins and canvas curtains to Elvar Corporation, Jackson, Miss., was abruptly cancelled.

Profit Downtrend — Automotive earnings are falling off sharply from the record high of a year ago. During its second quarter, GM net sales totaled $1,921 million compared with $1,963 million a year ago. Net income was off to $139 million compared with $273 million during the second quarter of last year. GM production of passenger cars produced in US plants was off 24 pct. Truck output was up 3 pct.

More to Government — Meanwhile, GM deliveries to the government climbed 30 pct over the first quarter, aggregating $230 million for the first 6 months of 1951. A significant factor in the GM report: Net income of $139 million was provided for stockholders compared with $245 million provided for US and foreign taxes.

A similar downward trend is reported by Nash-Kelvinator: Net earnings of $3,099,509 or 71¢ per share, compared with $2.21 per share in the June quarter of last year. George W. Mason, president, said the earnings reflect rising costs, higher taxes and controls.

THE BULL OF THE WOODS By J. R. Williams


HI, LIVERFOOT! HIYA, STOOPY!
THEY USED TO CALL TH' BULL LIVERFOOT BEHIND HIS BACK, AN' THIS KID MADE A BET HE'D CALL HIM THAT RIGHT TO HIS FACE, SO --
AND HE'S WON! HE WAITED TILL SOMEBODY WAS BEHIND TH' BULL-- HA-HA! PEOPLE ALWAYS THINK IT'S TH' OTHER GUY!
8-3
J.R.WILLIAMS
THE CUT-UP
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west coast progress report

digest of far west industrial activity

by R.T.Reinhardt

More Northwest Steel — About 12,000 tons of ingots will be added to the annual capacity of Northwest Steel Rolling Mills at Seattle if conversion of its original 3-ton-per-hour electric side charge furnace to top charge proves feasible.

Northwest has always had rolling capacity in excess of ingot capacity and the company is now attempting to remedy this situation by the addition of this converted furnace to its other two of approximately the same size.

A 440-ft by 85-ft warehouse and reinforcing bar fabrication shop opened early this year is now in full operation. Built at a cost of $350,000, the new facility is speeding up handling of orders now booked for a full year. The unique system of color code marking of bars instead of reliance on tags, as developed by Bethlehem Pacific Cast Steel Corp., has been adopted.

Strain Will Tell—Failure of the electric motor, powering the 22-in. mill of Bethlehem Pacific Coast Steel Corp. at Seattle 2 weeks ago, cut into production of some shapes but was expected to be repaired this week. Breakdown is attributed to heavy operation.

Openhearth operations at the plant continue at over-capacity rates in the face of a tightening scrap situation. Bethlehem is bringing in some additional scrap from Alaska and attempting to at least hold its inventories against the winter dearth.

Offshore contaminated scrap continues to be a headache to Northwest steel producers. Decontamination in the United States of potentially explosive material means scrap at the furnace costing as high as $75 to $100 per ton.

Five Good Years—Kaiser Aluminum and Chemical Corp. last month observed its fifth anniversary as an aluminum producer and roller in the Spokane, Wash., area.

Since the company leased the government-owned reduction plant at Mead and the rolling mill at Trentwood in 1946, capacity at both have been materially increased. Mead has added one pot line and the eighth is authorized, while Trentwood has stepped up its rolling capacity about 30 pct. In addition, a primary reduction plant at Tacoma has been added, making the total capacity of the two plants almost 400 million lb per year.

Speed of one cold-reduction mill at Trentwood has been increased from 880 ft per minute to 2300 ft per minute and the other two will soon be similarly modernized. By the time the New Orleans plant of Kaiser Aluminum is in operation the Trentwood rolling mill should be able to handle the total pig production of both primary reduction plants in the Northwest.

War Baby Reborn—Under direction of Leo H. Timmins, president of Pacific Northwest Alloys, Inc., the magnesium plant near Mead, Wash., will be in operation again early in September. Managerial and operational heads are at the site and ferrosilicon to be used in the process is being made and stored.

Some changes are being made in the furnaces which are expected to increase efficiency and may make the plant competitive with others.

Eugene Monroe, who will manage the plant, has had considerable experience in nonferrous smelting and has studied the operations of the Dominion Magnesium Co. at Haley, Ontario, Canada, which uses a similar process.

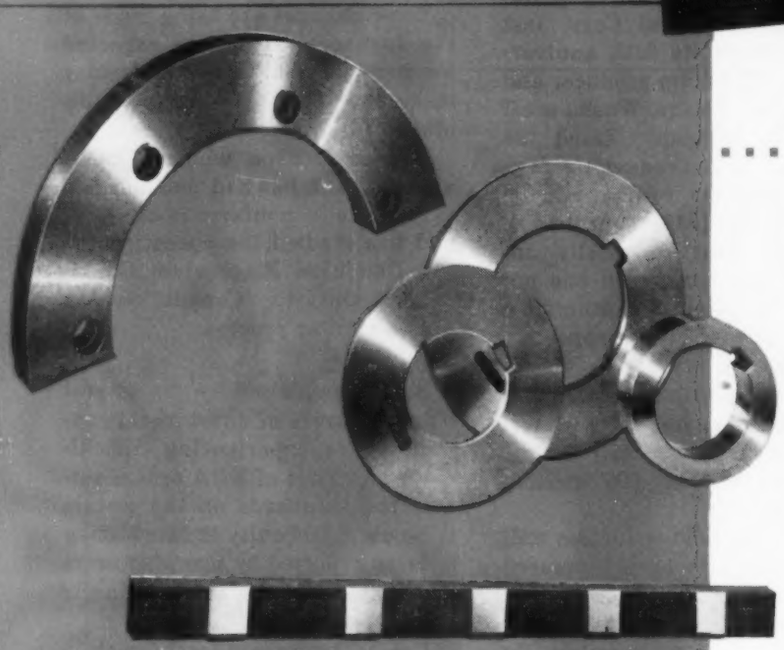
Can Complaints — Northwest manufacturers of sheet metal containers are experiencing difficulties as a result of NPA orders setting the standards on the metals to be used. Difficulty in fabrication is being reported by manufacturers who state soldering and welding is being complicated.

Use of lower grades of metals was expected to lower production costs, but just the opposite has resulted. One manufacturer still hopes to lower costs on about 80 pct of his containers if he can lick production problems.

. . . The Bowie Knife

Named for Colonel James Bowie of Alamo fame, this was the favorite knife of scouts and frontiersmen. With its rugged steel blade, from ten to fifteen inches long, the well-balanced Bowie Knife served equally well as a hunting knife or a combat weapon.

FAMOUS *Blades*



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the federal view

this week in washington

by George H. Baker

Super Priorities Coming—Graded priorities for defense production are on the horizon.

First government admission that the present (1 band) priority system is rapidly becoming unworkable came to light at a meeting of machine tool builders with NPA officials.

Fear Breakdown—NPA believes it could justify the establishment of "A" or "AA" priorities for the machinery industry on the basis of Defense Mobilizer Wilson's recent instructions to government agencies to stimulate production of machine tools.

Aircraft manufacturers, too, are clamoring for a graded priority system. Pentagon officials are willing to go to bat for them, but privately fear a banded priority system will soon break down ("AA" becomes "AAA," which becomes "AAAA") just as it did in World War II.

Planners Claim Credit—Age-old fact that government planners contribute nothing to a nation's productive efforts—except higher overhead—is ignored in a new Defense Minerals Administration report.

DMA, recently discovering sharp rises in output of iron ore, copper, and zinc, rushed out a report claiming credit for the upsurge in production.

Higher prices and the larger markets provided by defense mobilization probably had something to do with it, DMA says, but it was government issuance of maintenance, repair, and operation orders that "contributed directly" to the increase, Interior Secretary Chapman says.

Quote of the Week:

"How can the U. S. continue to build up the defenses required to save the entire free world from Soviet aggression if this build-up entails the payment to our allies of exorbitant prices for raw materials?"

—Sen. Lyndon B. Johnson

Spending on Schedule—Defense production is now scheduled to reach the present goal (20 pct of total national output) by this time next year.

Government economists predict that production will continue at peak rates in the months ahead. And further shifts from civilian production to military output will be felt by all industries.

Total national output earmarked for defense purposes is now 10 pct, as compared with about 5 pct a year ago. Military spending in June was at the annual rate of $36 billion, with about half of this amount going for hard goods.

Swap Steel for Oil—Interior Dept. officials concede that their offer to swap steel for oil with Mexico is a complete reversal of previous policy.

But they deny that the proposition has any connection with the threatened loss of Iranian oil. The new offer has been contemplated for "some time," they say. Up to now, Mexico has been unable to obtain steel from this country, even on a cash basis.

"There are many ways the U. S. can cooperate with Mexico, specifically through steel allocation, to increase crude oil production in the western hemisphere," Interior Dept. now says.

New Vote on Seaway?—Defeat of St. Lawrence seaway legislation in the House Public Works Committee last week may result in a reshuffle of committee membership.

Pro-seaway leaders at the Capitol are planning how to switch two committee votes in order to gain a favorable report on the legislation. The committee voted 15-12 last week to pigeonhole the remaining St. Lawrence bill before it.

Evidence of Packing?—Opponents of the project point to three recent appointments of pro-seaway members (Kluczynski, Machrowicz, and Magee) to the committee in recent weeks as evidence of "packing."

In the Senate, seaway bills still are under committee study.

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THE IRON AGE
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TECHNICAL ARTICLES

18-8 CAN BE CURED

after intergranular attack

By R. N. Gillmor
Head of Materials Section
General Electric Co.
Syracuse, N. Y.

Intergranular attack of 18-8 can be cured by holding for long periods of time in the sensitizing temperature range. Chromium diffusion from the unaffected areas into the impoverished grain boundary areas, rather than dissolving the precipitated chromium carbides, apparently affects the cure.

Since the advent of stainless steels over two decades ago, the users of 18-8 type stainless have been plagued by carbide precipitation and the subsequent danger of intergranular corrosion.

The generally accepted theory is that when 18-8 stainless is held or slowly cooled between 750°F and 1600°F the carbon, which was formerly in solid solution in the austenite, precipitates out at the grain boundaries as a chromium carbide, Cr_4 C, or as Austin[1] contends, Cr_{23} C_6. In so doing the area immediately surrounding the carbide is impoverished of chromium leaving a narrow but almost continuous pathway for corrosion to propagate at the grain boundaries.

A variety of tests have been developed to show the extent of the precipitation and subsequent impoverishment. Qualitatively it has been shown by the Strauss test, and more recently the Huey test. Both solutions attack the impoverished areas and frequently cause complete disintegration of the metal. Quantitative methods were devised, such as the magnetic balance by Payson[2] and electrical resistance measurements by Rutherford and Aborn[3]. Others found significant variations in the physical properties when the carbides were precipitated out of the solid solution.

The effect of grain size and carbon content were reported by Newell[4] and Bain, Aborn, Rutherford[5], and they set the pattern for the consensus that the smaller grained and lower carbon bearing 18-8 stainless steels are less easily sensitized and likewise less susceptible to intergranular corrosion than the larger grained and higher carbon 18-8 steels. While other elements, such as nitrogen, have an effect upon sensitization as shown by Uhlig[6, 7] it is generally felt that in the unstabilized grades of 18-8 carbon plays the major role.

For this series of tests, a typical mill run of type 302 stainless steel strip (0.031 in. thick) was chosen with the following chemical composition: 0.14 C, 18.67 Cr, 9.08 Ni and 0.046 N. Test 3x5 in. specimens were used. Half of the

samples were tested in the "as received" condition from the mill; annealed 1900°F, pickled, and rerolled lightly. The other half were water quenched after heat treating at 2300°F. The former had a No. 7 grain size and the latter developed a No. 3 grain.

Seven samples of each grain size were sensitized at 750°, 1000°, 1240° and 1500°F with one pair of specimens removed after intervals of ½, 1, 4, 16, 72, 240, 1000 and 1500 hr at each temperature. Each sample was sectioned to provide specimens for Strauss testing and for thorough examination under the microscope after very carefully timed etching periods in a 10 pct nital solution.

Each sample was studied under the microscope in an effort to estimate the degree of attack starting with 20 sec in the etching solution and proceeding by intervals up to 13 hr. Some of the specimens were etched in Murakami's reagent to reveal the presence, size, and location of the precipitated carbides.

Photomicrographs were made showing the effect of carbon content and grain size on the rapidity and extent of carbide precipitation at the various sensitizing temperatures. In each case this was correlated with the Strauss test on a part of the original sample.

Impoverished areas shown

A 10 pct nital solution seemed to be sufficiently strong to bring out the impoverished areas at the grain boundaries so that time studies could be made of both the rate and degree of impoverishment. Conversely, it was weak enough to adequately show the effect of both temperature, and time at temperature on the rate of chromium diffusion. With extended time at the sensitizing temperature, the samples etched more slowly and the boundaries were wider, indicating the gradual replenshing of the impoverished area by chromium diffusion from the more remote areas within each grain.

For showing intergranular attack caused by chromium impoverishment, the advantages of the 10 pct nital etchant over the conventional stainless steel etchants, such as electrolytic oxalic acid, is shown in Figs. 1. In A and C, the boundaries are fine and some grains have fallen out (black areas). These specimens likewise failed in the Strauss test. Neither at this or at higher magnifications did the oxalic acid etch (B and D) reveal carbides or any intergranular weakness.

When a sample of 18-8 was held in the sensitizing temperature range overnight and then submitted to the Strauss solution, all of the specimen was severely attacked except for a rim, approx 4 mils thick. This rim of decarbonized metal is extremely ductile. The balance of the sample, where there has not been any appreciable loss of carbon through decarbonization from holding at 1240°F for 16 hr, shows almost complete disintegration from the attack of the Strauss solution.

A portion of the sensitized sample which had not been Strauss tested was polished, etched in 10 pct nital, and examined under the microscope. Fig. 2 shows this rim effect of unattacked sound metal very well defined from the weak core with a large number of its grains (black areas) completely missing because the grain boundaries have been dissolved by the etchant and the grains fell out during examination.

Chemical analysis of the rim and center of the specimen showed the same nitrogen content (0.046 pct), while the ductile rim had 0.03 C as compared with 0.14 C in the core. This confirms present-day practice of limiting the carbon to 0.03 pct in these steels, in an effort to approach immunity from intergranular corrosion. In this single test nitrogen did not seem to be as measurable a factor as found by Uhling[6,7] nor was the carbon content as low, 0.015 pct, as found necessary for total immunity by Binder, Brown and Franks.[8]

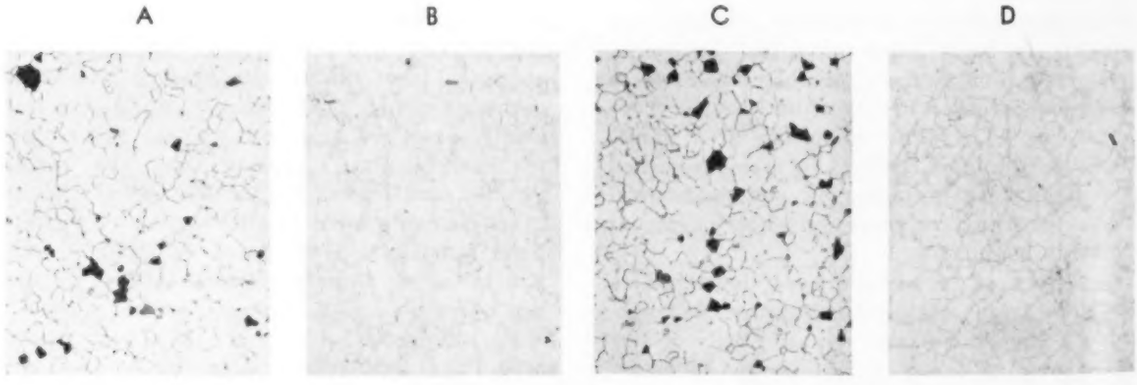

FIG. 1—Comparative action of 10 pct nital etchant and that of electrolytic oxalic acid on sensitized 18-8 stainless: A, exposed 16 hr at 1240°F, nital etch; B, 16 hr at 1240°F, oxalic acid etch; C, 72 hr at 1240°F, nital etch; and D, 72 hr at 1240°F, oxalic acid etch. All 100X.

FIG. 2—A portion of the sensitized sample which had not been Strauss tested but was etched in 10 pct nital shows rim effect of unattacked sound metal well defined from the weak core. 250X.

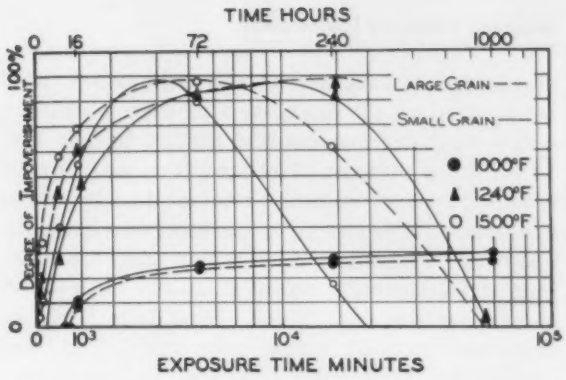

FIG. 3—Effect of temperature, time at temperature and grain size on the rate and degree of chromium improverishment in 18-8 stainless was plotted from observations of samples held at different temperatures for varying lengths of time.

It is generally agreed that the sensitizing temperature ranges from 750°F to 1600°F, depending on a number of variables such as carbon content, nitrogen content, grain size, and the degree of cold work previously imparted to the steel. To study the effect of temperature and time at temperature, pairs of samples, one large grained and one small grained, were held at temperatures of 750°, 1000°, 1240° and 1500°F for varying lengths of time: ½, 1, 4, 16, 72, 240, 1000, and 1500 hr. Portions of each set of samples were Strauss tested and examined after polishing and etching in 10 pct nital. From these observations, the curves shown in Fig. 3 were prepared.

At 750°F, none of the specimens reacted; and apparently it was too low a temperature to get carbide precipitation in this particular steel. However, some intergranular attack was shown on a severely cold worked sample after 240 hr at this temperature.

Reaction start sluggish

At 1000°F, both the No. 3 and No. 7 grain size specimens reacted almost identically. The reaction was sluggish, not starting until after 4 hr at temperature and not too severe after 1000 hr at temperature. After this long a time at temperature, the reaction was continuing and by no means complete.

At 1240°F, the effect of variation in grain size was more apparent. As compared with the 1000°F temperature, the reaction on all samples was more rapid, more severe, and more complete with some specimens having been cured by time at temperature.

At 1500°F, the action was more rapid at the beginning than with the 1240°F samples, and likewise more rapidly cured of intergranular attack. Some samples cured in approx 240 hr and all in less than 1000 hr at temperature. The replenishing of the areas deficient in chromium appeared to have started in the small grained sample; as a consequence, it cured itself before the larger grained sample had a chance to complete the cycle.

As far back as 1931, Newell[4] found that the smaller the grain size and the higher the degree of cold work, the less susceptible 18-8 stainless is to the intergranular corrosion. With either small grains or cold work, there are more places for the chromium carbide to form, and as a result, less impoverishment for the attack by corrosive agents. In the case of the severely cold worked samples, carbides form on the slip planes as well as at the boundaries.

At 1240° and 1500°F, it was found that the small grained samples were more sluggish in the early stages at temperature. It took between 1 and 4 hr at 1240°F for the smaller grained sample to show any intergranular attack, while the larger grained sample reacted almost instantaneously. Both sets of samples were slower in curing themselves.

At the highest temperature, 1500°F, the reaction was more rapid for all samples at both ends of the test. The small grained steel was more sluggish at the start but cured itself in approx 240 hr at temperature while the large grained cured itself sometime between 1000 and 1500 hr.

In a close comparison of the reaction of both grain-sized samples to the 10 pct nital etch, in both instances the first to etch were the 72-hr, 1500°F samples, and while it took only 20 sec to bring out the boundaries of the large grains, it took 2 min to produce the same effect on the small grained sample. It would appear that the impoverishment was somewhat less for this time at temperature of the smaller grain and it therefore cured itself more rapidly. This confirms the early work of Bain, Aborn, and Rutherford.[5]

Contrary to other findings, no coalescing of the chromium carbides was observed in this investigation with extended time, 1000 hr, in the sensitizing range. Samples respectively held 16 and 1000 hr at 1240°F exhibited about the same size of chromium carbide particles at the grain boundaries.

The 1000-hr sample, while exhibiting chains

of chromium carbides at the boundaries, had been cured of all intergranular attack and resisted both the Strauss test for 200 hr and the 10 pct nital etchant. The structure was finally revealed after etching electrolytically with oxalic acid. The curing of the steel was brought about by a rediffusion of chromium into the impoverished areas, rather than any coalescing of the chromium carbides. It is felt that the chromium carbide forms very rapidly in the sensitizing temperature range and remains stable as to nature, size, and location.

At the sensitizing temperature, the carbon and chromium in this type of stainless steel have a high affinity for each other and precipitate out readily at the grain boundaries as chains of chromium carbides, leaving an envelope of chromium impoverishment surrounding each little carbide. This carbide formation leaves in its wake an irregular, but continuous film of metal very deficient, if not almost void, of chromium. This non-corrosion resistant film etches readily in a 5 pct nital solution, as shown in Fig. 4.

Can "cure" sensitized steel

A microscopic study of the effect of time on carbide precipitation, chromium impoverishment, and subsequent intergranular corrosion showed that it is possible to "cure" the sensitized steel and put it back into the stainless condition. Samples were held at the sensitizing temperature 1240°F for ½, 1, 4, 16, 72, 240, 1000 and 1500 hr respectively. Photomicrographs are shown in Fig. 5.

An attempt was made to etch each sample in a 10 pct nital solution. The untreated, ½-hr, 1-hr, and 1000-hr samples failed to etch even after they had been kept in the etchant for 12 hr. In their order of intensity, the 72-, 16-, 240-, and 4hr samples started to show signs of grain boundary attack after 2 min in the etchant. After 6 min in the nital, the order of attack changed to 72-, 240-, 16-, and 4 hr samples.

The positions changed again after 30 min of etching, the 240-hr sample being most heavily etched, followed by the 72-hr, 16-hr, and 4-hr samples in that order. This same order remained constant for the remainder of the 12 hr. These positions of the samples by degree of attack were judged by visual examination under a microscope.

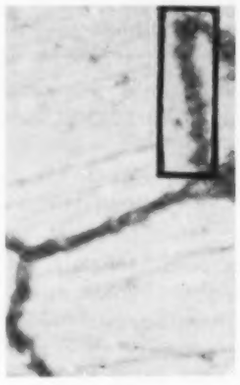

FIG. 4—An irregular but continuous film of metal very deficient, if not almost void, of chromium is left in the wake of carbide formation. Sample was exposed 72 hr at 1240°F, etched in 5 pct nital; 2000X.

A study of the speeds at which the four etchable samples reacted to the nital proved that, for this grain size, composition and temperature, the sample with 72 hr exposure was impoverished of chromium at the grain boundaries to the greatest degree, since it etched the most rapidly. C and D, Fig. 5 (240-hr sample), have shown a continuation of where the chromium carbide was formed at the expense of its immediate surroundings.

After 240 hr at temperature, the chromium from a slightly more distant area moves in to "heal" or replenish the extremely low-chromium areas. In so doing, it slightly weakens the area from which it came, so that it takes a longer time for the etchant to attack. After 12 hr the structure exhibits the exaggerated grain boundary shown in D, Fig. 5. Here a chain of car-

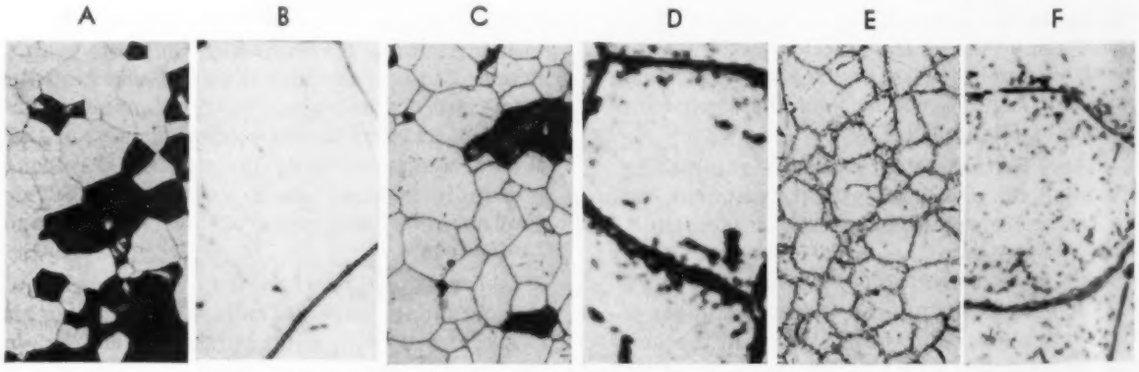

FIG. 5—Sample A, exposed for 72 hr at 1240°F, shows the greatest degree of chromium impoverishment at the grain boundaries, etched 12 hr in 10 pct nital; 250X. B is the same sample at 2000X. C and D are sample exposed 240 hr, etched 12 hr in 10 pct nital, 250X and 2000X respectively, showing a continuation of the mechanism depicted in Fig. 4. E and F, exposed 1000 hr and etched in 10 pct oxalic acid, show carbide precipitation with neither intergranular corrosion nor serious chromium impoverishment of any area, at 250X and 2000X.

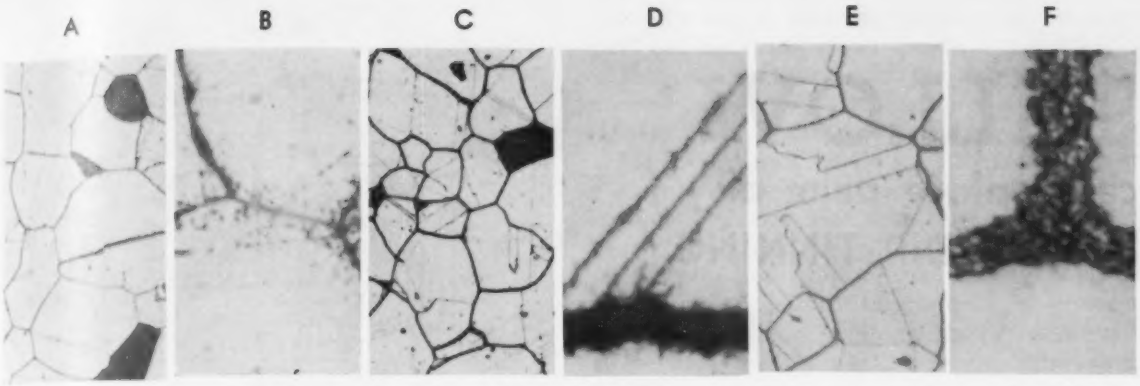

FIG. 6—A and B are a sample exposed for 72 hr at 1500°F, etched in 10 pct nital, which shows maximum impoverishment at 100X and 2000X; C and D show partial healing through diffusion with extended time of 240 hr, etched in 10 pct nital, 100X and 2000X; in E and F, final diffusion has almost been reached with 1000 hr exposure, etched nital and oxalic, 100X and 2000X.

bides can still be detected and only the grain boundary and near-boundary area have been affected.

The etching characteristics and microstructure of the 1000 hr sample were next studied. This sample refused to etch after 12 hr in the nital solution. It also refused to show any breakdown or loss of ductility after 200 hr in the Strauss test. Still, it will be noted in F, Fig. 5 (taken after the sample was electrolytically etched in oxalic acid) that carbide precipitation is present; in fact, there is a whole chain of chromium carbides in one boundary. Carbide precipitation is present with neither intergranular corrosion nor serious chromium impoverishment of any area.

In this final act there was a continuation of the chromium movement until all of the low-chromium areas were "healed," i.e., their composition was built up to a point where the steel is again stainless. The revitalized grain boundaries may no longer contain 18 pct Cr, but it is doubtful that they contain much less than 17 pct. For all practical purposes this steel is fully stainless. The specks which appeared only after the sample was etched in oxalic acid are possibly nuclei from which some chromium was drawn to fill in the low-chromium areas.

Slow diffusion strengthens

This demonstrates that the stainless steels which are susceptible to intergranular corrosion may be cured by holding them at the sensitizing temperature for 1000 hr or more, a rather impracticable treatment as reported by Zapffe[9].

This initial and sudden weakening of the grain boundaries followed by strengthening through slow diffusion is even more clearly exemplified by holding the larger grained steel at 1500°F for ½ to 1000 hr and examining after etching in 10 pct nital, see Fig. 6.

References

[1] *J. B. Austin, "Effect of Changes in Condition of Carbides of Some Properties of Steel", Trans., American Society for Metals, Vol. 38, 1947, p. 28.*

[2] *P. Payson, "Prevention of Intergranular Corrosion in Corrosion-Resistant Chromium-Nickel Steels", Trans. AIMME, Iron & Steel Div., Vol. 100, 1932, p. 306.*

[3] *J. J. B. Rutherford and R. H. Aborn, "A Quantitative Method for the Estimation of Intercrystalline Corrosion in Austenitic Stainless Steels", Trans. AIMME, Iron & Steel Div., Vol. 100, 1932, p. 293.*

[4] *H. D. Newell, "Influence of Grain Size on the Properties and Corrosion Resistance of the 18-8 Iron-Chromium-Nickel Alloy for Elevated Temperature Service", Trans., American Society for Steel Treaters, Vol. 19, 1931-1932, p. 673.*

[5] *E. C. Bain, R. H. Aborn, and J. J. B. Rutherford, "The Nature and Prevention of Intergranular Corrosion in Austenitic Stainless Steels", Trans., American Society for Steel Treaters, Vol. 21, 1933, p. 481.*

[6] *H. H. Uhlig, "The Comparative Effect of Carbon and Nitrogen on Intergranular Corrosion of 18-8 Stainless Steel", Trans., Electrochemical Society, Vol. 87, 1945, p. 193.*

[7] *H. H. Uhlig, "The Role of Nitrogen in Stainless Steels", ASM Trans., Vol. 30, 1942, p. 947.*

[8] *W. O. Binder, C. M. Brown, and R. Franks, "Resistance to Sensitization of Austenitic Chromium-Nickel Steels of 0.03 Pct Maximum Carbon Content", ASM Trans., Vol. 41, 1949, p. 301.*

[9] *C. A. Zapffe, "Stainless Steels", ASM Book, 1949, p. 50.*

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TALLOW
can replace palm oil IN HOT DIP TINNING

By G. C. Ference,
Research Chemist
and
W. R. Johnson,
Research Metallurgist
Armour Research Institute
Chicago

Mill tests indicate modified prime beef tallow can be a more than satisfactory substitute for palm oil in hot dip tinning. It is cheaper, doesn't have to be imported, can be tailor-made to varying specifications. And it doesn't need dewatering, preheating or dilution with used oil.

A substitute for palm oil in hot dip tinning has been developed. It has passed several mill tests and has been tentatively accepted by canning companies for use in tinning food containers. Further tests will probably clear it with the exacting requirements of this industry.

Palm oil is vital to both high-speed cold reduction mills and to the making of hot dip tinplate. It is imported from the Dutch East Indies and North Africa. During the last war, the East Indies source of oil was completely cut off and the North Africa supply was imperiled by submarine warfare. Although a shortage of palm oil never seriously hampered steel production during the war, such a possibility was imminent for several years. After the war when price controls were lifted, the price of palm oil rose rapidly from 9 to almost 40¢ per lb.

These factors provided an incentive for steel mills, individually and through the American Iron and Steel Institute, to search for possible strategic and economic substitutes for palm oil. Oil producers and compounders threw their efforts into the search. Others entering the picture were the Southern Regional Laboratory and several large independent research organizations. The most fruitful results appeared in the field of hot dip tinning.

In the making of hot dip tinplate, sheets of pickled steel are passed by means of rolls through a flux into a bath of molten tin and up through an 18-in. layer of hot palm oil floating on the tin. Three sets of rolls, operating in the oil, smooth and thin the tin coating while the hot oil keeps the tin from freezing.

Several operating requirements in a substitute oil for hot dip tinning are evident: The oil must make clean, bright, prime plate. The oil must not be an undue fire hazard. It must drain rapidly from the sheet merging from the pot, and clean off the sheet rapidly in the wet washer and branner. The oil must not interfere with can making procedure. It must be non-toxic and preferably edible, And, of course, the oil must be economical.

A fundamental study was conducted at Armour Research Foundation of Illinois Institute of Technology, under the sponsorship of the Ameri-

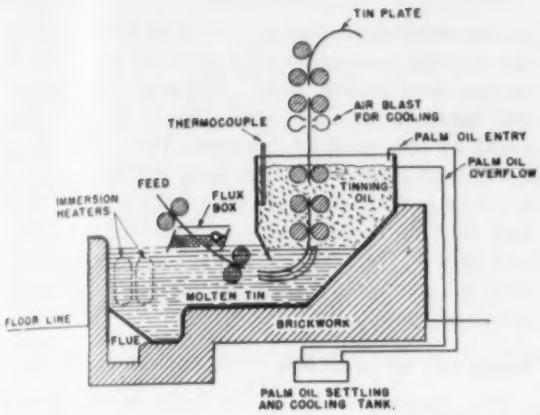


DIAGRAM of hot dip tin pot, showing where palm oil is utilized. Beef tallow can be used in same manner.

FLUXING ACTION of a tinning oil is demonstrated in the Petrie dish test. Active oil, left, parts and exposes tin surface by rapid dispersion of the oxide film.

can Iron and Steel Institute, on why palm oil should work well as a hot dip tinning oil. It was soon established that a tinning oil must possess a fluxing action; that is, it should have the ability to remove tin oxide from a molten tin surface. A simple laboratory test, called the petri dish test, was devised to measure this ability. In this test a sufficient quantity of tin is melted on a hot plate, to completely cover the bottom of a petri dish. The tin is kept at a temperature of 465°F. Approximately 7 g of oil are added to the tin surface. If the oil parts and exposes the tin surface by rapid dispersion of the oxide film, the oil is an active oil and the length of time over which the oil dewets the tin is a rough index of the oil's useful life. An inactive oil does not part but lies quiescent on the tin.

It was determined that the free fatty acid content in palm oil gives it the fluxing ability. The function of the acid appears to be that of a dispersing agent for tin oxide. Analysis shows that palm oil does not react chemically with tin oxide although it does with tin. Also, palm oil can be made inactive in the petri dish by preventing the formation of tin oxide by keeping everything in an inert atmosphere of nitrogen gas or by addition of aluminum or magnesium to the tin so that their oxides provide a protective layer.

A satisfactory oil must drain rapidly from the tinplate emerging from the pot. If this does not occur, the oil consumption becomes prohibitive; and the resultant influx of oil into the cleaning system renders the wet washer inefficient and greatly increases the consumption of bran. It was found that the oil break in the tin pot and the speed with which the oil drains from the emerging sheet are related to the oxide removal properties of the tinning oil and thus to its free fatty acid content.

Oil viscosity is critical

The layer of oil drains from the sheet until the oil film is sufficiently attenuated for oxygen to diffuse through to the molten tin. Once the oil break starts, it proceeds rapidly because the oxide film, which forms instantaneously at the exposed molten tin surface, slides rapidly down the sheet by the pull of the oil. The oil drainage thus proceeds by a tin oxide-tin shear, rather than by the shear of one oil layer over another, as is the case for drainage of an inactive oil, such as mineral oil.

Oil viscosity at pot operating temperatures is important because if the viscosity is too high, the initial attenuation of the oil on the emerging sheet cannot occur fast enough to give a complete break. Oil viscosity at wet washer temperatures has a direct bearing on the ease of cleaning and branning. To quickly evaluate these viscosities, simple dip type viscosimeters were made with internal dimensions much like that of the standard Saybolt tester. Two different orifice diameters were used, one at 0.069 in. was used for testing at the operating temperature of 465°F, and the other at 0.200 in. for use at cleaning temperatures of 150° to 200°F. In operation the tester was submerged in oil, allowed to come to temperature, and then removed vertically. The drainage time, measured by stop watch, was a value of oil viscosity.

Palm oil in a tin pot increases in viscosity because of polymerization, and because of the formation of metallic soaps. Fresh oil must be added at intervals because of oil losses due to volatilization and dragout on the tin plate. If the replenishment rate of the oil is great enough, the increase in viscosity is compensated for. If the oil replenishment is low, the viscosity keeps

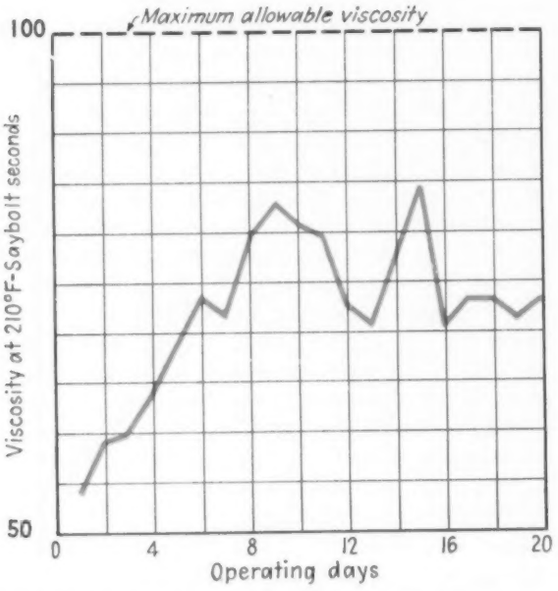
increasing until it reaches a point where oil has to be bailed out and new oil added to dilute that left in the tin pot. By use of the viscosimeter, it is possible to see whether a substitute oil can be kept at or below palm oil viscosity levels when using the same or a lower replenishment rate. The tests consisted of heating oil, in contact with tin, at a temperature of 465°F. Daily a measured quantity of oil was removed and fresh oil added to make up both the volatile and bail-out losses. A study of palm oil consumption in the tinplate industry indicates that a daily replenishment rate of 18 pct is a good average for experimental use.

As a result of the fundamental studies, enough information was obtained to suggest that a specialized modification of beef tallow might prove an ideal substitute for palm oil. Chemically the two are similar in that they are fatty acid esters of glycerine. A typical analysis of the fatty acid constituents of the two materials is given in the accompanying table.

Linoleic acid is considered the worst offender in causing the viscosity increase in palm oil; beef tallow contains a substantially lower amount of this material.

CHEMICAL COMPOSITIONS

Acids	Chemical Formula	Palm Oil, pct	Beef Tallow, pct
Myristic	$C_{14}H_{28}O_2$	1.0	3.0
Palmitic	$C_{16}H_{32}O_2$	42.5	29.0
Stearic	$C_{18}H_{36}O_2$	4.0	18.5
Oleic	$C_{18}H_{34}O_2$	43.0	46.5
Linoleic	$C_{18}H_{32}O_2$	9.5	3.0
Constants			
Saponification Value		195-205	196-200
Iodine Number		44-58	40-50
Titer °C		40-47	40-45



VISCOSITY of modified beef tallow in tin pot during a production run. Viscosity stayed below the point at which bail-out and addition of new oil would be needed.

Any desired amount of free fatty acid, to obtain the activity associated with palm oil, can be added to the beef tallow base. Although the greater the amount of free acid, the lower the flash point of the product becomes, there is a great margin of safety. Typical flash and fire points of a tallow containing 8 pct free fatty acid are 505° and 590°F, respectively, as received and 550° and 650°F, respectively, after a heat bodying test, as compared to figures of 435° and 490°F for fresh palm oil.

Tests run at Weirton

The results of laboratory tests on beef tallow were encouraging enough to warrant a production hot dip tinning test at the plant of Weirton Steel Co. The special tinning tallow was purchased and made to specification. The product was made from a prime beef tallow base. The tallow was deodorized by commercial processes until only a bland odor remained. Free fatty acids, consisting of acids split from hydrogenated tallow, were added to conform to the desired level determined experimentally. Analysis showed a content of 9.6 pct.

The tallow was charged directly to the tin pot with no preheating being done, contrary to common practice with palm oil. Since the tallow was water free, all additions of fresh tallow were made without fear of foaming or splattering caused by contained water. Prime plate was produced immediately. The tin pot ran smoothly, producing the normal output with somewhat less menders than the average with palm oil. The oil break from the emerging sheet was satisfactory throughout the run, thus, at no time was it necessary to bail out during the run in order to reduce the viscosity.

Tallow and oil have same viscosity

The tinplate industry uses Saybolt Universal seconds at 210°F as a viscosity measurement on palm oil. Many plants agree that palm oil should not be allowed to rise over 100 SUS at 210°F. Normally, this criterion cannot be used for substitute oils, because oils having different viscosity indices may have the same viscosity as palm oil at the operating temperature of 465°F but have a radically different viscosity at 210°F.

Fortunately prime beef tallow and palm oil have virtually the same viscosities at temperatures ranging from their solidification points up to 465°F. For this reason, the Saybolt viscosity at 210°F can be applied to the tallow. The accompanying graph shows a plot of the tallow viscosity throughout its run. It can be seen that at no time did the tallow viscosity approach the point at which bail out operations begin. The maximum reached was 84 sec.

A total of 17,000 base boxes of 1.25 lb tinplate was produced with menders averaging under 1 pct. The tin yield was normal. The average oil consumption for this production was 0.22 lb of oil per base box produced. This con-

sumption compares favorably with the industry average of 0.3 lb of palm oil consumed per base box of tinplate produced. Wet washer operations proceeded normally, and bran consumption after the wet washer was only 0.5 lb per base box. The oil coating weight on the cleaned and branned sheet was normal. The finished plate at all times was bright and clean.

Scotch tape lacquer adhesion tests applied to phenolic lacquers were run on the finished tinplate with no failures recorded. Baking discoloration tests, consisting of heating plate at 410°F for ½ hr, showed no failures.

Analysis of the free fatty acid content of the tallow in the tin pot showed 9.6 pct at the start, a low of 7.0 pct during the run, and a high of 11.5 pct at the conclusion of the test. The ash content of the oil at the finish of the run was 2.3 pct, which was in line with ash content of used palm oil.

The experimental laboratory tests and the production run substantiated modified beef tallow as a potential hot dip tinning oil; time and continued experience with it in the mills, however, will be the only true test of its worth.

A much larger quantity of palm oil is used in the cold reduction of steel. At present the Armour Research Foundation is working on this phase of the problem. If, as is hoped, some tallow derivative proves to perform on the mill as well or better than palm oil, wide scale substitution would free the mills from dependence on imported palm oil.

APPARENT BEEF TALLOW ADVANTAGES

1. Original cost is lower. Tallow price is controlled, palm oil is not. Even before controls, tallow price was lower. Tests so far indicate tallow consumption is lower than palm oil.

2. Tallow is produced in large quantities in the U. S. Palm oil is imported.

3. Tallow is a tailor-made product. The prime beef tallow base is rigidly selected. The amount and kind of free fatty acids to be added can be specified by the buyer if desired.

4. Tallow is free of water and is high enough in flash point to permit straight additions without preheating, dewatering, or diluting with used oil.

Mr. Ference since preparation of this article, has become Rocket Line Supervisor, Badger Ordnance Works, Baraboo, Wis.

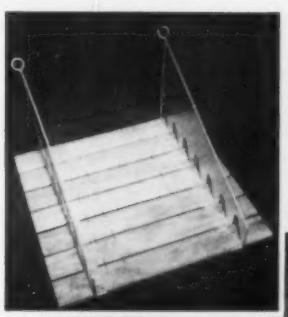
New pallet eliminates forks

Detachable sheet-metal wings, equipped with heavy wire rings, make possible pallets only 1-in. thick in the new materials handling system introduced by Automatic Transportation Co., Chicago. The new pallet is lifted and carried by hooks mounted on a conventional lift truck, in place of the forks normally used. In a three-high tier, 15 in. of vertical space that would ordinarily be taken up by the standard 6-in. pallet depth is saved.

Since no forks are required, the new system cuts the amount of space that must be given over to aisles. Also, railroad cars may be loaded right up to the door.

The new pallet consists of a single layer of boards equipped with three pairs of slots. The vertical metal wings may be inserted at the width best suited to the materials stacked on it.

It is said that the new system of materials handling can be easily integrated into existing methods. The lift truck that has been especially designed for use with the re-designed pallet is equipped with forks which fold up out of the way of the hooks. For load-spotting, this same truck is available with a side shifter attachment. This permits moving loads several inches to either right or left while the truck itself remains stationary.



HOOKS, NOT FORKS are used to lift this new, 1-in. thick pallet. In three-high stacking it saves about 15 in. vertical space. Wings are inserted in any of the three pairs of slots shown.

BOTH NEW AND OLD palletizing methods are visible here. In front of this lift truck's foldaway forks may be seen a loaded pallet of the new type. Older, thicker pallets are stacked in the background.

Etched pattern Identifies Lighter Tinplate Coat

By John Kolb
Associate Editor

Positive identification of the more lightly-coated side of dual tinplate is made possible by an etched diamond pattern. This lightly etched marking results from acidified palm oil, applied at high speeds by a rubber roller.

Production of tinplate with a heavier coating on one side had for some time been recognized as a possibility on the electrolytic coating lines. Until recently, however, tinplate producers lacked an incentive for further investigation of this possibility. Manufacturers of cans were satisfied with plate having the same thickness of tin on both sides, and little attention had been directed to the idea of using a lighter coating on the less important outer surface.

Tin Shortage Changed Picture

But this was before Korea, and prior to the NPA and controls on use of critical metals. National Production Authority Order M-8, limiting use of tin to 80 pct of average consumption during the first quarter of 1950, has changed the picture. Supplies are tight and the situation threatens to worsen in the near future, spurring developments for tin conservation. Both producers and consumers are striving for means of stretching the curtailed supply over the greatest possible production.

At least a partial solution to the problem is found in dual coatings such as are now in regular production at Weirton Steel Co., Weirton, W. Va. The No. 4 electrolytic line at this company, shown in Fig. 1, has been adapted to dual coatings, and several substantial shipments have already been made. The lines at Weirton are particularly well suited to dual coatings, since they have been coating one side of the strip at a time; only minor changes were necessary, and the line can now turn out dual-coated tinplate at speeds up to 2500 fpm.

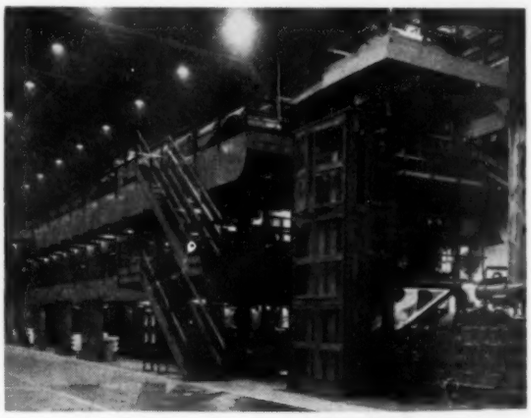


FIG. 1—Portion of the 480-ft long No. 4 electrolytic tinplate line at Weirton Steel Co., which has been adapted to dual coating production. Marking takes place at the top of the vertical flow brightening unit shown at the right.

The major problem associated with production

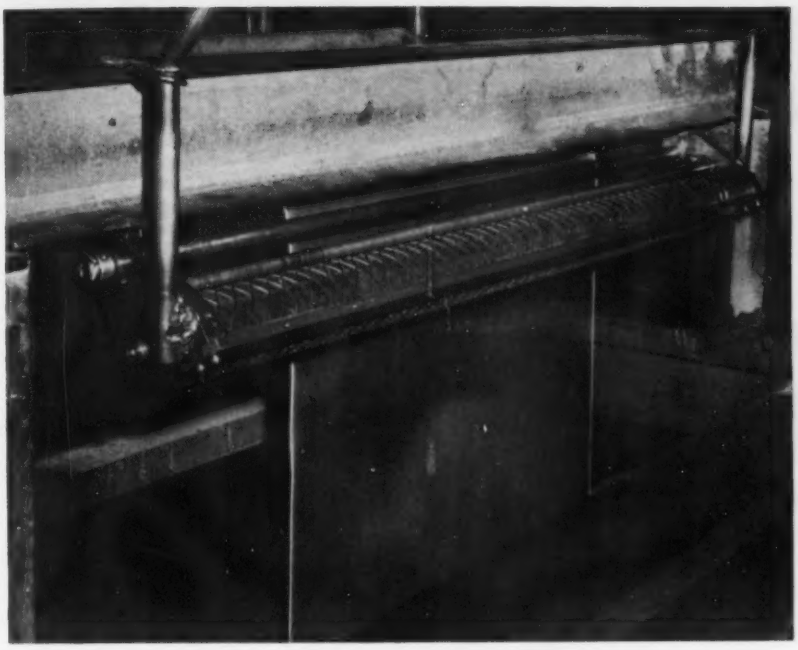


FIG. 2—Diamond pattern on the rubber roller is etched onto the surface of the tinplate at speeds as high as 2500 fpm. The pan for the acidified palm oil etchant has been removed in this view.

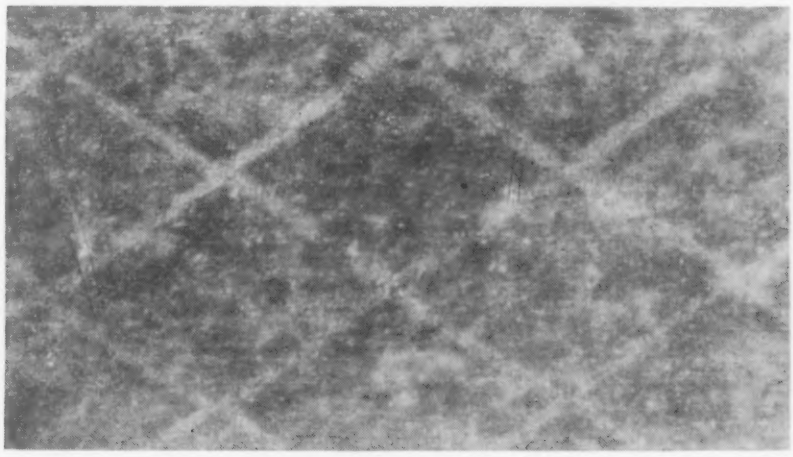


FIG. 3—The etched diamond pattern, shown here actual size on a sheet of tinplate, is sufficient for marking and does not affect the plate.

of dual tinplate was in finding a suitable means for identifyling the sides. One side had the same appearance as the other, so users needed a positive indication as to which had the lighter coating. In addition, the marking has to be in the form of an overall pattern, since the sheets are usually cut into small pieces for can manufacture.

Inks, paints or other color patterns were undesirable, since a great number of cans are lithographed or otherwise labeled directly on the tin surface. The pattern would in some cases "bleed through" and create labeling difficulties.

The solution was found in an etched diamond pattern, applied to the matte surface of the tin before it goes through the flow brightening operation. The etchant used is an acidified palm oil. After both sides of the plate have been coated, the strip runs at high speed through washing and drying stages. The side having the lighter coating then passes against a rubber roller as shown in Fig. 2, which prints the diamond pattern with the palm oil mixture.

The pattern remains intact during the flow brightening and subsequent operations. This lightly etched marking, shown in Fig. 3, gives clear identification of the lighter coating, while at the same time having no appreciable affect on coating quality. Tests have shown the etch to be light enough so as not to increase the porosity of the tinplate, or shorten the eventual shelf life of the finished can.

CONTINUOUS DIP SYSTEM

improves tar coating

By F. R. Adams
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Rudisill Foundry Co.
and

G. E. Loftin
Engineer
Hamilton Research & Engineering Corp.
Anniston, Ala.

A continuous dipping system using a heated tar bath for cast iron soil pipe and fittings gives a coating superior to that produced where pipes are heated and then dipped. Products cannot be overheated in the heated bath, and just enough residual heat for quick drying is retained.

For most of the tar usually used in coating cast iron soil pipe and fittings the temperature of the castings must be 300°F or higher to obtain a good, dry finish. Two accepted methods for transferring the heat necessary for successful tarring are in use. One is to heat the pipe to over 300°F in a heating oven and then dip it in a tar bath that has no heat source except the hot pipe (excluding steam coils necessary for pumping tar). The other method is to maintain a tar bath at 300°F and dip pipe at ambient temperature, allowing them to remain in the tar until they have reached a temperature of 300°F.

Of the two methods, the former is by far the most widely used at present. However, the latter is claiming much attention.

The Rudisill Foundry Co., Anniston, Ala., has completed a new tar coating system in which tar is heated and pipe dipped at ambient temperature. A powered overhead conveyer delivers pipe to be coated and submerges them in the bath by a lowered section in the conveyer rail.

In this method the pipe must remain submerged long enough to reach the 300°F temperature of the bath. Having a maximum conveyer speed known, submersion time depends solely on the rate of temperature rise of the pipe. To determine this rate, tests were made using a tar bath maintained at 300°F into which was placed specimens of soil pipe with thermocouples attached.

Specimens were cylinders cut from 4-in. "Victory" weight soil pipe with wall thickness approx 0.15 in., and a 4-in. "Victory" weight hub with approximate maximum thickness of 0.40 in. These pieces were the extremes of the pipe thickness. A potentiometer with contacts for four thermocouples was used so that simultaneous readings could be obtained of atmospheric temperature, tar bath temperature, and two readings of specimen temperature.

Thermocouples were attached to specimens as indicated in Fig. 1. Three 1/16 in. diam holes, ¾ in. deep were drilled 120° apart in each specimen, and two constantan wires and one iron wire were inserted; good contact was insured by packing the holes with iron and steel cement.

Bath held at 300°F

This arrangement of wires, when connected to the potentiometer, yields two separate readings of temperature, the iron wire acting as a common return for both constantan wires. The experimental tar bath was a 16 x 16-in. 16 gage steel tank 12 in. deep with 3/16 in. round bars attached to the sides about 2 in. from the bottom to prevent the specimen coming in contact with the heat source.

When the tar bath reached 300°F, the gas

burner was regulated to maintain this temperature. After the bath temperature leveled off at 300°F, a specimen was lowered into it and readings of tar bath temperature, ambient temperature, and specimen temperature were made every 30 sec until specimen temperature reached 300°F. Results of the test are shown in Fig. 2.

From this graph it can be seen that the 4-in. Victory hub, being the thicker of the two specimens, required 6 min to reach bath temperature. Since atmospheric temperature when tests were made was 81° F, results were extrapolated to yield time for temperature to rise from 40°F, which was taken as design temperature of pipe before dipping. This time is indicated as 6.7 min. Therefore, for a safety factor, an immersion time of 7.5 min was decided upon. This time, together with the maximum speed of 8 fpm of the conveyer, establishes the length of dip for pipe to be totally immersed as 60 ft.

For every 1° rise in temperature of the pipe, a certain amount of heat is removed from the tar, which in turn must be received by the tar from a heat source. The amount of heat required for raising temperature of pipe may be found by the following equation:

$$Q = M \times C \times (T_2 - T_1)$$

A 4-in. Victory weight soil pipe weighs approx 40 lb, so this is the value of M. Specific heat (C) of iron as given by Oberhoffer* is 0.127. Temperature of pipe leaving the bath (T_2) is bath temperature or 300°F, while temperature of pipe entering bath is the established design temperature of 40°F. Therefore, Q is in this case 1321 Btu. Thus, for every 40-lb pipe passing through bath, 1321 Btu must be added from a heat source.

* "Mechanical Engineers Handbook", Lionel S. Marks, p. 300.

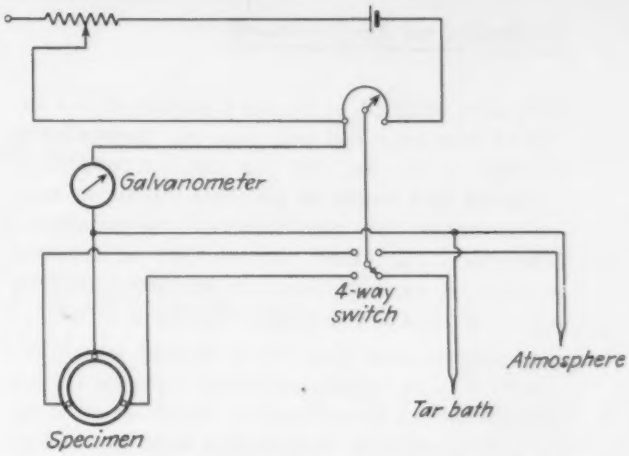


FIG. 1—Thermocouple-potentiometer circuit used in the heat absorption tests to give simultaneous readings of atmospheric and tar bath temperatures, and two readings of specimen temperature.

Not all of the heat passed by the tar bath goes to the pipe. Because of the difference of temperature between the atmosphere and the bath, a flow of heat will occur. This heat must be replaced along with the heat required for heating the pipe. For accurate determination of this heat loss, a test of a non-heated tar bath of similar construction, i.e. 8 ft deep submerged in the floor, was made.

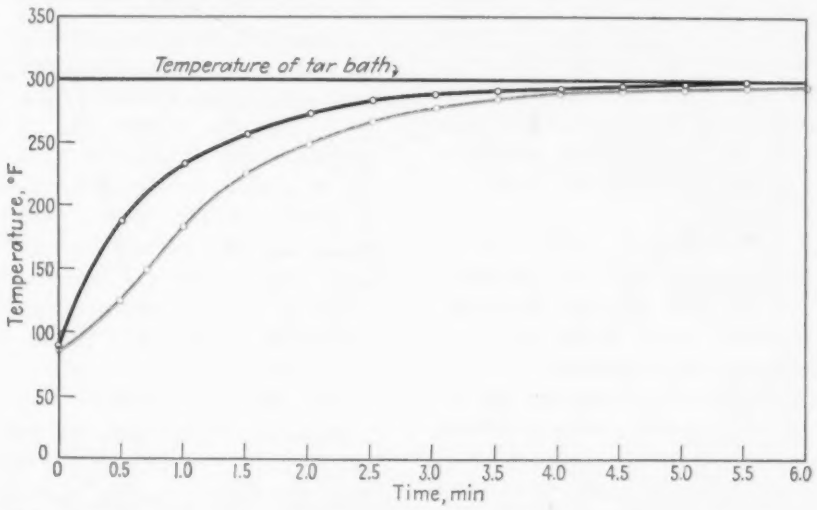


FIG. 2—The solid curve shows the temperature rise of a cylinder cut from a 4-in. Victory weight soil pipe immersed in the 300°F tar bath. The colored line is the 4-in. Victory weight soil pipe hub, which required 6 min to reach the 300°F temperature of the bath.

The temperature of the tar bath was read after dipping was completed for the day and again checked sometime later before dipping was commenced. At the first temperature measurement a reading of 320°F was obtained and, 15 hr 20 min later, the reading was 220°F. Knowing the weight of tar involved, the previous equation can once again be used to determine heat loss, which was 376,500 Btu for 7530 lb of tar.

This represents the heat loss through a sur-

face area of 12.57 sq ft over a period of 15.3 hr. All of this heat did not pass out through the surface of the tar, but for similar conditions of depth and width of pit, this condition may be assumed for simplicity of computations. Therefore, for every square foot of exposed surface in an 8 ft deep tar pit, there will be a loss of 1958 Btu per hr at 270°F.

It can be seen that for a system which requires pipe to remain submerged for 60 ft, the tar pit should be covered as much as possible with insulation to reduce this heat loss. For example, with the type conveyer used at Rudisill, it would require a 96-ft tar bath to allow pipe to remain submerged for 7½ min. The pit being 4 ft wide gives a surface area of 384 sq ft. Of this area, it is possible to cover 212 sq ft with an insulating material that will allow only 50 Btu per sq ft (hr) to pass at 300°F.

If the pit is not covered where possible, a heat loss of 384 x 1958 or 751,872 Btu per hr will occur. However, by insulating 212 sq ft a heat loss of only 347,376 Btu per hr will occur. This represents a heat saving of 404,496 Btu per hr or 405 cu ft of 1000 Btu gas per hr by covering the pit.

To determine the proper size heat source required for a tar bath, a summation of heat requirements must be made. Loss of heat to the surroundings will remain constant for a given air temperature and bath temperature. Heat transferred to the pipe depends upon the tonnage of pipe passing through the bath.

Steam coils provide heat

The unit under consideration was designed for a capacity of 400 pipe per hr. The heat required from the heat source is the heat lost to the atmosphere plus heat required to bring pipe from 40°F to 300°F, or 875,776 Btu per hr. For a capacity of 400 pipe per hr, the lost heat makes up a considerable amount of the total, but if the number of pipe the unit is capable of handling increases, it assumes lesser proportions.

Knowing the heat requirements of the system, it was only necessary to select a heat source that would give an even distribution of heat to the dipping tank. Steam coils with a working pressure of 150 psi and temperature of 366°F were decided upon. Use of a heat source where the maximum temperature is 366°F eliminates a "coking" problem with the type coal tar used, and also eliminates excessive heating of the pipe and fittings.

Steam coils will easily pass to tar 20 Btu per hr per sq ft per degree Farenheit difference. With a temperature difference of 66°F, steam coil transfer area becomes 664 sq ft. A 2-in. pipe 1.608 ft long has a surface area of 1 sq ft, so the length of pipe required was 1068 ft.

Minimum boiler horsepower for minimum steam usage of 1022 lb per hr was set at 26.2 boiler hp. To all design computations a reasonable factor of safety was added to insure satisfactory operation.

For the heated tar bath system, selection of coal tar of the correct consistency is very important, since a greater quantity is involved for continuous dipping. The tar must be volatile enough for quick drying and have a boiling point high enough to withstand continuous heating at 300°F. A tar with the specifications listed in the accompanying box proved very satisfactory.

TAR SPECIFICATIONS

Float test at 50°C, 100 to 200.
Specific gravity at 25°C, not less than 1.16.
Total bitumen, not less than 75 pct by weight.
Water, 1 pct by volume.
Distillation, pct by weight:
to 170°C, not more than 1.0.
to 270°C, not more than 10.0.
to 300°C, not more than 20.0.
Softening point of distillation residue, 40° to 70° C.
Material produced from 100 pct coke oven coal tar.

Viscosity check maintained

After 7 to 10 days operation of the dipping unit a globular deposit was noted on the bottom of the pipe. This deposit was apparently caused by an increase in viscosity of the tar. A systematic check of viscosity was installed, using the float test for bituminous material as prescribed by ASTM. It was found that if a maximum viscosity of 200 sec at 50°C was maintained in the bath, no deposit appeared on the product. By adding a small amount of volatile components once each week, mainly phenols and creosote oils, the bath can be maintained at the correct consistency.

Since placed in operation, the unit has given very satisfactory results, the final coating being superior to the coating received on products passing through the company's old dipping system, where pipe is heated and then dipped. No adequate control is maintained over the heat transfer to the product in the old system, and many times pipe and fittings are dipped while they are too hot. When removed from the bath, the great amount of residual heat in these pieces drives off the light oils plus a portion of the effective coating. Because steam coils with 150 psi pressure are used, it is impossible to overheat products passing through the heated bath, and only enough residual heat is retained to cause quick drying.

Mr. Loftin is now plant engineer, U. S. Pipe & Foundry Co., Chattanooga, Tenn.

Effect of structure on machinability DEMONSTRATED

By Norman Zlatin
Partner
and
Leonard Nowikowski
Metallurgical Engineer
Metcut Research Associates
Cleveland

Investigation of 3140, 4140 and 8640 steels shows that machining properties are the same when they have been heat treated to the same structure. Structure is a better criterion of machinability than chemical composition. Differences in structure mean less when carbide tools are used. Resulfurizing to about 0.1 pct improves machinability.

Investigation of three alloy steels shows the machining properties of a steel should not be judged by chemical composition so much as by the microstructure. To control the machining properties of a steel, one should carefully control the heat treating procedure so as to put the steel in a definite microstructural form.

This investigation of AISI 3140, 4140 and 8640 steels emphasized the need for additional work to determine the type of structure obtained by conventional annealing practices. It was found, in general, that it was extremely difficult to decide on the proper heat treating cycle to obtain a desired microstructure. Little work has been done along these lines in the past, probably because few have realized the importance that microstructure plays in machining.

Heats of the three steels were carefully selected at the steel mill. One ingot of each heat was resulfurized so as to contain approximately 0.1 pct sulfur, to determine the effect of resulfurization on the pertinent machining properties. Parts of each heat were rolled to 4-in. diam for tests on annealed structures, and parts were rolled to 3 in. for tests on quenched and tempered structures. The table gives the chemical composition and bar sizes of all the steels tested. A total of 35,000 lb of steel was rolled by the mill for these tests.

TEST BAR ANALYSES

Steel	Bar Diam, in.	Constituents, pct C	Mn	P	S	Si	Ni	Cr	Mo
3140 Plain	3	0.39	0.77	0.026	0.021	0.27	1.34	0.66	....
3140 Plain	4	0.39	0.77	0.026	0.021	0.27	1.34	0.66	....
3140 Modified	3	0.39	0.77	0.026	0.08	0.27	1.34	0.66	....
3140 Modified	4	0.39	0.77	0.026	0.08	0.27	1.34	0.66	....
8640 Plain	3	0.42	0.91	0.017	0.021	0.24	0.52	0.54	0.22
8640 Plain	4	0.42	0.91	0.017	0.021	0.24	0.52	0.54	0.22
8640 Modified	3	0.42	0.91	0.017	0.10	0.24	0.52	0.54	0.22
8640 Modified	4	0.42	0.91	0.017	0.10	0.24	0.52	0.54	0.22
4140 Plain	3	0.42	0.91	0.026	0.022	0.26	0.17	0.98	0.18
4140 Plain	4	0.42	0.91	0.026	0.022	0.26	0.17	0.98	0.18
4140 Modified	3	0.42	0.91	0.026	0.09	0.26	0.17	0.98	0.18
4140 Modified	4	0.42	0.91	0.026	0.09	0.26	0.17	0.98	0.18

The hot-rolled bars received from the mill were cut into 18-in. lengths and heat treated into the desired annealed or quenched and tempered states. An attempt was made to anneal the bars

Machinability of three alloys (continued)

to obtain essentially a structure consisting of 75 pct pearlite and 25 pct ferrite. In order to accomplish this, specimens were taken from representative bars and an experimental cycle set up in the laboratory. This cycle was then transferred to the commercial heat treating practice to obtain the desired results.

Bars for machining as annealed steels were normalized at 1650°F for 2 hr, reheated at 1500°F for 2 hr, furnace cooled to 600°F, then air cooled to room temperature. Bars tested as quenched and tempered steels were normalized and reheated in the same manner, quenched in water, and tempered at these temperatures: 8640, 1100°F; 3140, 975°F; and 4140, 1050°F. The resulfurized bars were tempered at: 8640, 1075°F; 3140, 950°F; and 4140, 1100°F.

It was found extremely difficult to control the cooling rate in the air furnaces sufficiently to match the structures previously obtained in the laboratory. This indicates the need for more adequate furnace controls, especially with respect to rate of cooling. Specification of a rate as "furnace cooling" is generally inadequate for controlling microstructure. On these tests, the cooling rate was 65°F per hr. Some of the actual microstructures obtained in the heat treating of

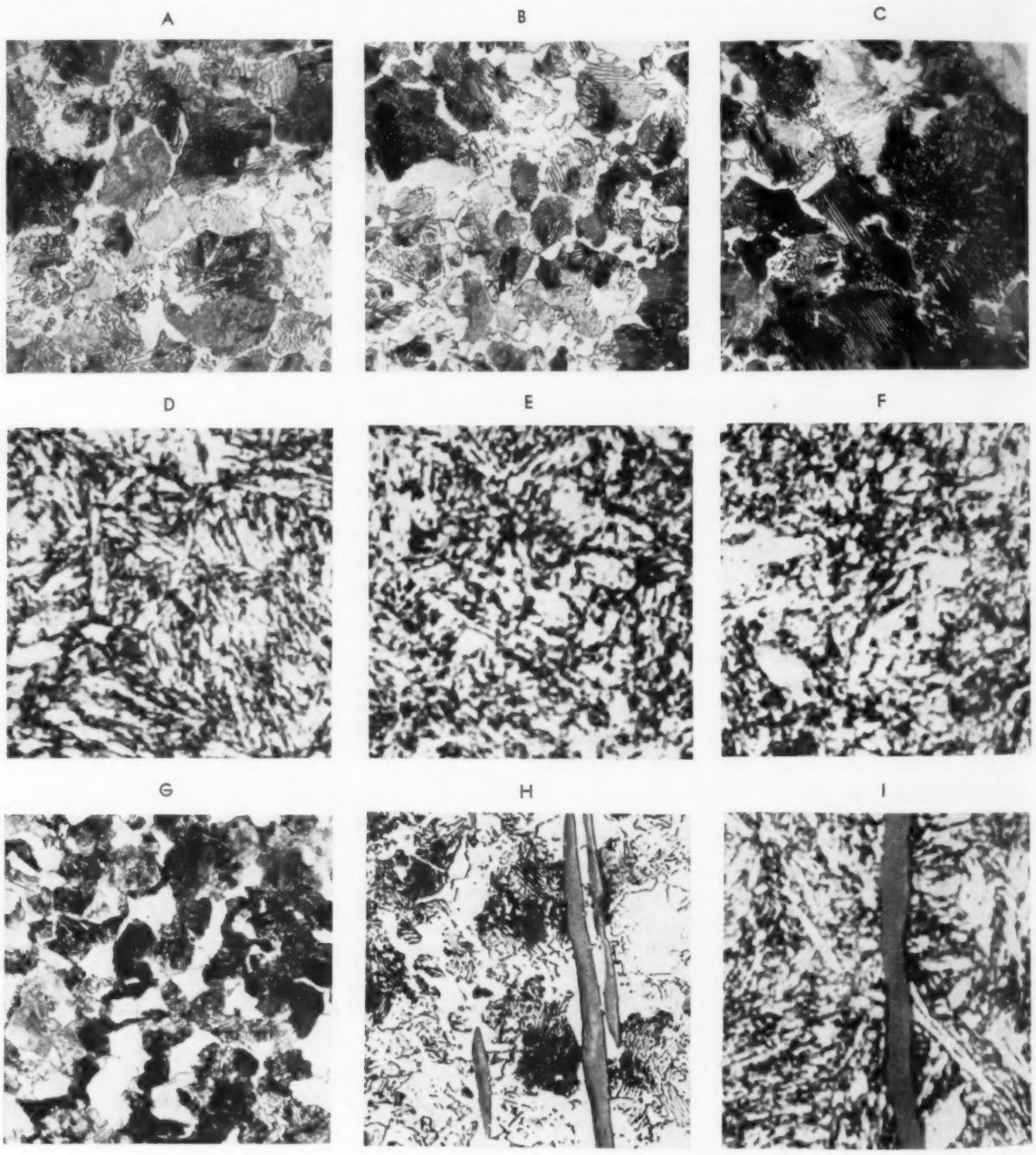


FIG. 1—Typical microstructures of metals in this investigation. (a) 3140, annealed, 75 pct pearlite, 25 pct ferrite. 500X (b) 8640, annealed, 75 pct pearlite, 25 pct ferrite. 500X (c) 4140, annealed, 90 pct pearlite, 25 pct ferrite. 500X (d) 3140, tempered martensite, 300 Bhn. 2000X (e) 8640, tempered martensite, 300 Bhn. 2000X (f) 4140, tempered martensite, 300 Bhn 2000X (g) 4140 from different ingot, annealed, 65 pct pearlite, 35 pct ferrite. 500X (h) Modified 8640, annealed, 60 pct pearlite, 40 pct ferrite, plus manganese sulfide. 500X (i) Modified 3140, tempered, 300 Bhn, plus manganese sulfide. 2000X

the plain and resulfurized steels are shown in Fig. 1.

In the case of the 4140 steel it was found impossible to obtain the desired microstructure even in the laboratory. The attempt was made to obtain lamellar pearlite with about 25 pct free ferrite. Instead, 90 pct lamellar pearlite and 10 pct free ferrite resulted. Any attempt to produce more free ferrite produced instead partial spheroidization of the carbides. Here again is seen the need for studies in annealability along the same lines as those which have been carried out in the past on hardenability. In particular with reference to machinability it is important to define conditions for precipiation of adequate free ferrite.

Tests were made with both carbide and high-speed steel tools on an American Pacemaker lathe. The lathe was equipped with a variable speed drive so as to obtain the desired cutting speed required in any particular test run. Carboloy 78B was selected for the test as representative of the general purpose steel cutting grade of carbide. Tests were run until the carbide tool reached a wear land on the relief of 0.030 in. The high-speed tool was removed from service when either the tool nose broke down or when a 0.060-in. wear land was developed.

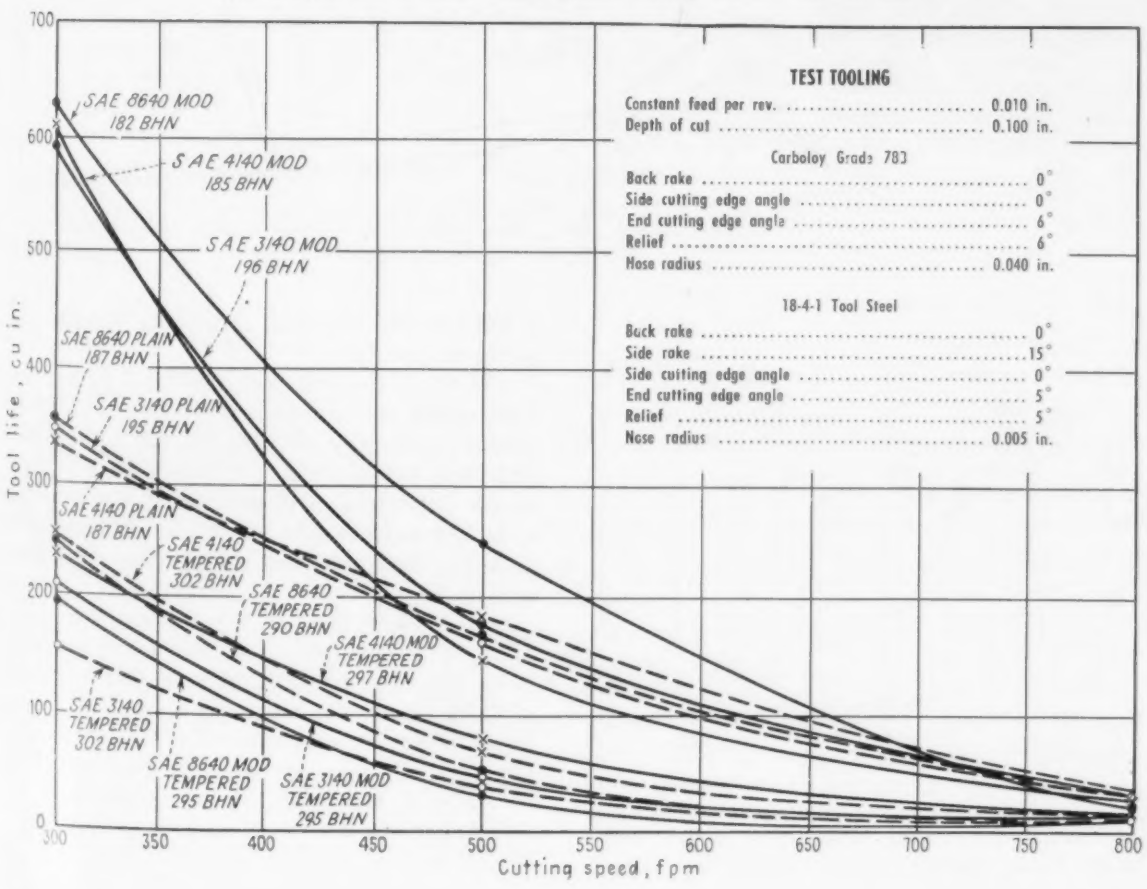
The tool life is plotted in the accompanying graphs against cutting speed for both the carbide and high-speed steel tools. The tool life is given in terms of cubic inches metal removed to produce specified tool wear.

The tool life results when machining with the carbide tool are shown in Fig. 2 for all the steels tested. Three separate bands are noted under which the steels can be grouped. The first or upper band represents the resulfurized annealed steels. The middle band represents the plain annealed steels while the lowest broad band represents the plain and resulfurized tempered steel.

It is evident from this chart that the carbide turning of the three 40-pct carbon steels is remarkably similar. The chart also points out the improvement in tool life which is shown by the high sulfur additions to the steels. It should be noted that the sulfur content of these resulfurized steels is of the order of 0.1 pct, which is higher than that used in the ordinary resulfurizing process.

Fig. 3 shows the tool life v. cutting speed characteristics for the annealed plain and modified steels when turned with high-speed steel tools. It is evident from these curves that greater differences occur in tool life characteristics between the different structures when turn-

FIG. 2—Tool life in cubic inches against cutting speed. Carbide tool.



Machinability of three alloys (continued)

ing with high-speed tools than with carbides. With high-speed tools, therefore, a closer control on structure is necessary than when turning with carbide tools. The poor tool life results obtained with the 4140 modified steel are caused by the fact that this steel could not be annealed so as to obtain as much free ferrite as in the case of the 3140 and the 8640 modified steels.

The tool life test results shown for the annealed 4140 steels are for the 1650°F normalized and 1500°F annealed heat treatment.

The tool life results for high-speed steel turning of the tempered steels are shown in Fig. 4. The differences in tool life within the plain or the modified bands are attributed not so much to the slight differences in hardness, but rather to the fact that probably other products were present in the tempered structures besides tempered martensite.

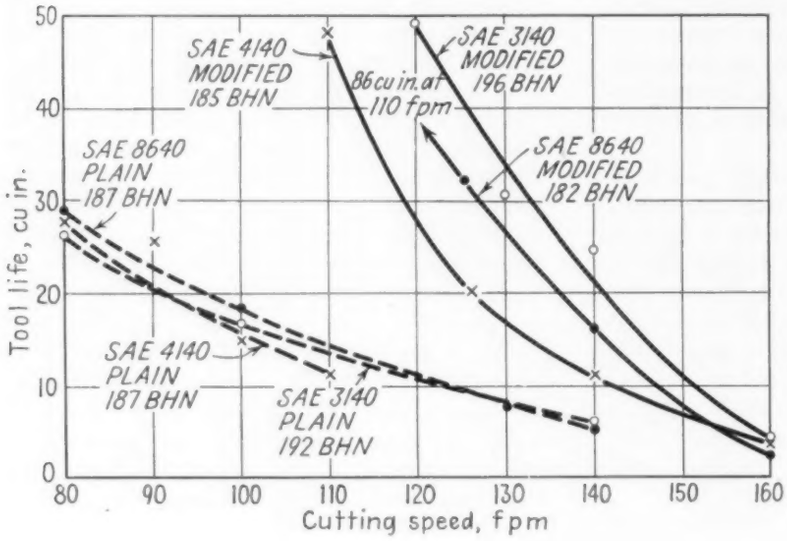


FIG. 3—Tool life in cubic inches against cutting speed. Annealed steels. High-speed steel tool.

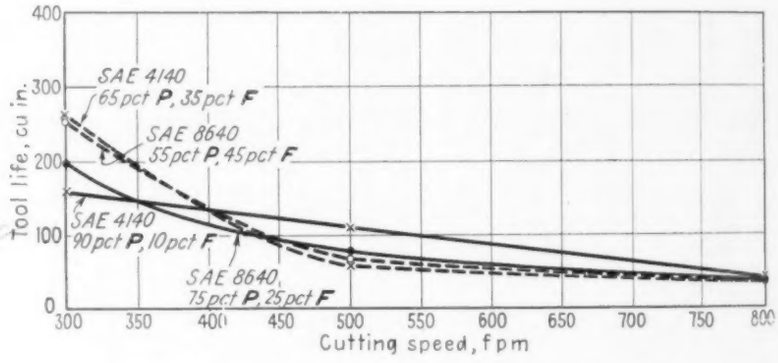


FIG. 5—Tool life in cubic inches against cutting speed. Annealed steels. Carbide tool. Showing influence of higher percentage of pearlite obtained from a second sample of SAE 4140.

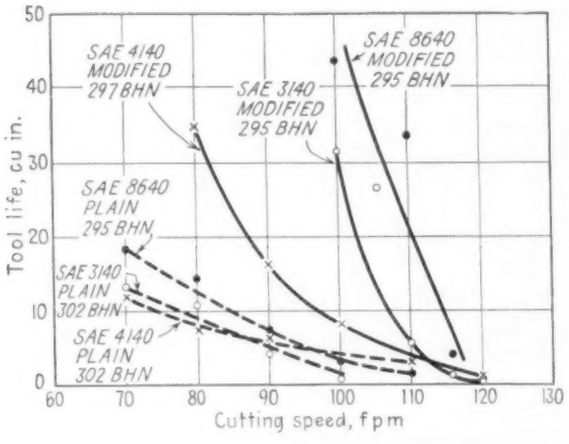


FIG. 4—Tool life in cubic inches against cutting speed. Quenched and tempered steels. High-speed steel tool.

The 4140 annealed steels could not be put into comparable microstructural state due to their reluctance to produce free ferrite. Data were therefore drawn from a different heat of 4140 which was annealed to produce 35 pct free ferrite. The tool life data for this steel is compared with the 8640 steel and the previous 4140 steel in Fig. 5.

In this chart the tool life failures are shown after 0.015-in. carbide tool wear which happened to be the only data available on this new heat of 4140. Here it is seen that there is a gradual improvement in tool life with the increase of free ferrite. Note especially the close similarity of the 4140 steel with 65 pct pearlite—35 pct ferrite and the 8640 steel with 55 pct pearlite—45 pct ferrite.

news of industry

ORE BOATS—Launch Greatest Building Program Ever

Great Lakes fleet to add more than 20 ships . . . Converted "Victory" ships will start hauling this season . . . Greatest expansion program in steel's history—*By Bill Taylor.*

The ship building and conversion program of Great Lakes carriers, to increase shipments of iron ore represents the greatest project of its kind in Lake history. The fleet, which handled better than 78.2 million tons of ore in 1950 has, says The Lake Superior Iron Ore Assn., hauled 10,857,604 tons more this season than during the corresponding period last year—more than 80 pct of the ore used by the nation's mills.

During 1950 one new ship was added to the fleet by Inland Steel Co. and in 1951-52 it is expected that more than 20 ore-carrying vessels will begin service on the lakes. By comparison, during World War II only six ships were added, on charter from the U. S. Maritime Commission, by Cleveland Cliffs Iron Co.

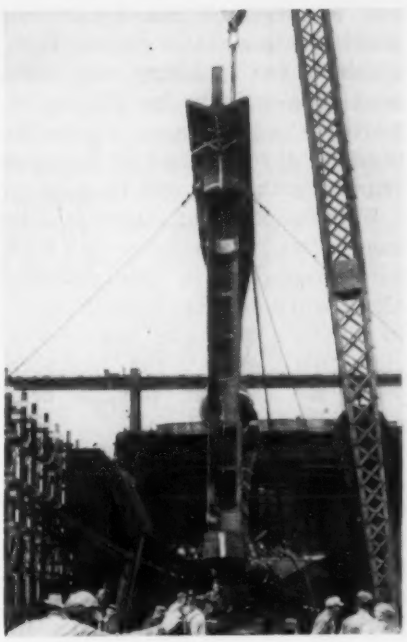
Conversion Job Faster — Steel companies for the most part have contracted for the construction of these vessels with shipyards from coast to coast. The ships ultimately will be floated to the Great Lakes. In a report issued last week Lake Carriers' Assn. said the 20 new or converted vessels will be capable of handling about 345,000 tons.

Although it is not considered economically sound, by some quarters, the conversion of "Victory" ships has been undertaken for it takes much less time to convert a vessel than it does to construct a new ship. Work on the Cliffs Victory, a conversion job for Cleveland Cliffs, was begun on Jan. 1 and was completed Apr. 1. Taking only 3 months to convert, it then took 1½ months to reach Chicago from the Portland, Ore., shipyards and an additional few weeks for fitting out before its first ore-carrying assignment.

Faster, More Durable—In comparison, the first of three new ships, with a capacity of 18,500 tons each, now being built by U. S. Steel Co. will be completed late this year though its keel was laid in mid-December, 1950. Being built for U. S. Steel's Great Lakes subsidiary, Pittsburgh Steamship Co., these three new vessels will be faster and will have greater capacity and life expectancy.

Republic Steel Co., also interested in keeping its ore stockpiles at operating levels, has a 70 pct interest in three vessels now being lengthened and converted for Nicholson-Universal S. S. Co. The first of these will be ready for launching this month and will be in service before the lakes freeze. It is hoped the other two, each with a capacity of about 16,000 tons, will also be ready for their trial runs before the current shipping season ends.

These ships are not being built as part of a replacement project but rather to increase the ore-carrying tonnage. Many of the older — considerably slower and smaller — vessels will ultimately be scrapped but not until the emergency demand has lessened.



FRAMEWORK: The 96,000 lb propeller and rudder stern frame gets lined up to insure placement to tolerances of one-sixteenth of an inch. The unit is for one of the two ore carriers being built at Lorain for the Pittsburgh Steamship Co., a U. S. Steel Co. subsidiary.

Award Merchant Ship Contract

Federal Maritime Administration has awarded a contract for construction of five Mariner-type merchant ships to Bethlehem Steel's San Francisco yards. Estimated cost of each ship is $9,493,000.

At a press conference in New York last week Bethlehem Chairman Eugene Grace said that a nice shipbulding program was shaping up. He said it was nothing sensational, but that shipbulding business had steadily been getting better. He cited ore boats and fast merchant vessels. Withdrawal of ships from the mothballed fleet is continuing.

ALUMINUM—The In's and Out's of Expansion

Government pushing new companies wrong way in expansion program . . . High costs force higher prices . . . Integration pays off, is best approached backward—*By Bob Hatschek.*

The aluminum industry today is expanding, almost mushrooming. War or not, aluminum would have stayed on the upsurge but abnormal war demand has forced expansion into a faster sprint. Government and industry are both pushing aluminum for all they're worth. The politics as usual attitude has thrown some of the government's thinking off base.

With its policy of intolerance to monopolies, Washington wants new producers in the primary aluminum field. But it wants them to produce pig and ingot—and stop there. What the planners don't see is that this is economically impracticable.

Out of Game—Apex Smelting Co., which was trying to get in on the ground floor of the government's 500,000-ton expansion program, was forced to drop out. High costs were the bugaboo. In order to make 2¢ per lb profit on pig aluminum, Apex would have had to charge 22¢ for it, 4¢ more than the established producers. Preferential treatment could not be given, so the company made its exit.

Harvey Machine Co. is having difficulty getting necessary financial backing but they are optimistic and going ahead with their plans to enter the field. A Reconstruction Finance Corp. loan has not yet been approved.

Capital investments required under these inflated times are terrific. It costs about $850 per ton of aluminum reduction capacity and another $300 or $400 if you want to integrate further for a more economic operation by providing your own alumina. It is practically impossible for a small new firm to pay this and then enter a competitive field.

Want Prices Low—The price of any commodity is set by the marginal producer, an elementary concept, but the "big three" of aluminum do not want to see prices rise.

They want prices to be as low as possible because the future of their industry is dependent on increased use of the metal. The steel industry used the same philosophy. But this won't come about unless aluminum prices drop still further.

Fabricated aluminum is what brings in the profits and carries primary metal financially. It seems that the best way to get into primary production is through the back door—that is, by starting as a fabricator and slowly working your way back to aluminum reduction, alumina production and bauxite mining. This is a sort of reverse evolution into an integrated operation, the best economic proposition.

Power Problem — Aluminum production is also dependent upon power availability and, while hydroelectric power is the cheapest, new facilities are being built for natural gas use. Aluminum Co. of America is planning to use lignite in Texas and consideration is also being given to coal. Hydro power is so overloaded in the Northwest that a brownout would be necessary to keep some of the new facilities working in the event of a low-water year.

New companies must therefore try to get government power which is already tight or they must build their own power plants. The latter, of course, increases capital expenditures even further and the power would not be as cheap.

Aluminum, just reaching maturity as a tonnage metal, has a big future and new companies *will* get into the business. But it is a tough proposition.

Alcoa Puts Faith in Lignite

Lignite for power in war and peace will be used in the planned Aluminum Co. of America reduction plant in Milam County, Tex. This is another first application of a new fuel by the industry, illustrating its hunt for power materials. The power plant and the 85,000-ton per year plant will cost about $80 million and will start producing in a little over a year.

After having investigated the lignite-to-steam-to-electricity cycle with its Denver pilot plant operated by the Bureau of Mines, Texas Power & Light Co. will build and operate the power plant for Alcoa.

The new smelter will have easy access to large high-grade lignite with good BTU content per lb and low water content. Heat content is perhaps half that of bituminous and moisture runs about 33 pct as compared to a normal 50 pct.

Aloca is now enlarging its Point Comfort, Tex., plant to produce a yearly 35,000 tons. It is also building a new 85,000-ton smelting plant at Wenatchee, Wash., and another plant at Bauxite, Ark., for production of alumina.

Pipeline Passes Verdict: Aluminum Pipe Didn't Corrode

The verdict was no discoloration or corrosion at all when a 40-ft bare aluminum bypass in Alabama-Tennessee Natural Gas Co.'s 8-in. aluminum pipeline was uncovered recently.

It had been under earth for 17 months and was installed with special bypass valves so that it could be dug up without interrupting flow of the main pipeline serving Reynolds Metals Co.'s Listerhill, Ala., plant.

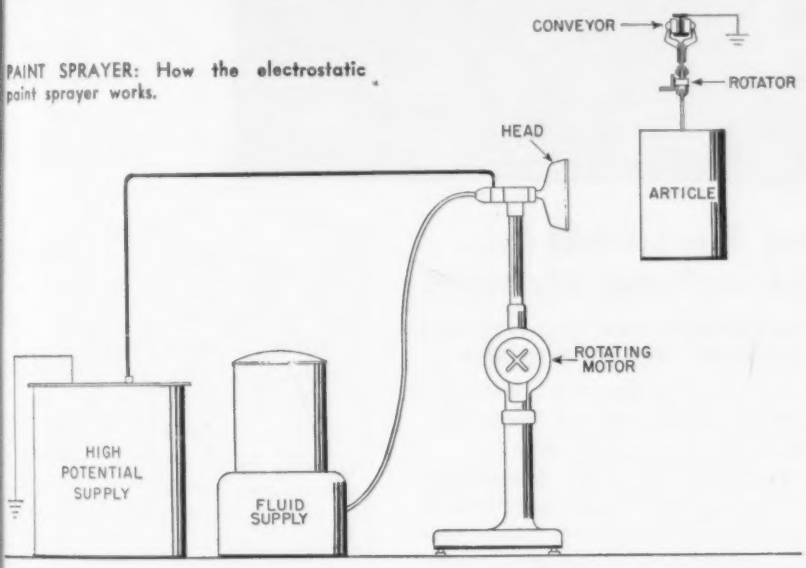
Alabama-Tennessee and Reynolds officials agreed that the pipe could last indefinitely.

PAINT SAVING—New Spray Method Developed

No spray guns or compressed air . . . Process uses principle of electrostatic atomization . . . Paint collection methods unnecessary under new procedure—*By Gene Beaudet.*

An entirely new method of spray painting developed by the Ransburg - Electro - Coating Corp., Indianapolis, was unveiled for the first time at a press conference held at the company's plant in Indianapolis last week. Called the Ransburg No. 2 Process, to distinguish it from the company's other electro-spray system using conventional air spray guns, it can be used to coat most items that require conveyorized finishing operations to achieve high volume production.

PAINT SPRAYER: How the electrostatic paint sprayer works.



Paint utilization efficiency ranges from 95 to 99 pct and company officials claim the process will coat 25 to 75 more pieces per gallon than any other spray finishing system now in use.

No compressed air is used in the process. Therefore, paint loss resulting from air atomization when spray guns are used is done away with. This new type of gun employs the principle of electrostatic atomization. It consists of a hollow, dynamically balanced, cone shaped head made of meehanite.

Coating material flowing to the head at a constant rate from a metering pump is spread uniformly over its inner surface and is brought to the outer edges by rotating the head at high speeds.

A strong electrostatic field is set up between the head and the piece by a source of electrostatic high potential, one terminal of which is connected to the head and the other grounded. The piece to be coated is grounded by the conveyor. The paint is deposited on the piece by the force of the electrostatic field which changes the fluid at the head into finely charged particles and sets up an attraction that pulls them to the grounded piece. From 200,000 to 300,000 paint particles leave the head every second.

Variables such as air pressure, spray pattern, fluid delivery, and over spray exhaust currents, usually present in other spraying operations, are virtually eliminated. It relieves spray painting from dependence on the part of the operator and skill of the hand spray man. Water washed walls for the collection or removal of wasted paint are unnecessary and ventilation of the area for control of solvent vapor is all that is needed.

Results from units installed in several plants throughout the country have been extremely satisfactory. At one of Butler Mfg. Co. plants a 60 pct increase in production and paint utilization was achieved on the spraying of roofing and siding for navy utility steel buildings. Furthermore, one operator handled a volume that formerly required seven hand spray men. Metal ironing boards coated by Geuder, Paeschke and Frey Co., Milwaukee, used 25 pct less paint than Ransburg's electro-spray process using air guns.

Interstate Metal Products, Inc., Michigan City, Ind., was able to coat four times as many metal chairs for the Air Corps per gallon of paint than with a hand spray. The production rate was increased from 550 to 1300 per day.

Industry Gets Approval Of $9,806,378 in U.S. Defense Loans

Defense Production Authority has okayed 15 new defense loans totaling $9,806,378. Sum of all loans approved since Dec. 18 is $70,627,882. The new authorizations include:

S. K. Wellman Co., Cleveland, manufactures friction discs for tanks, machinery, $3,800,000 for building equipment.

Tyson Bearing Corp., Massillon, Ohio, makes tapered roller bearings, $1,275,000 for machinery, equipment.

Berea Rubber Co., Cleveland, synthetic rubber "O" rings for planes, $575,000 for building, equipment.

Stover Lock Nut & Machinery Corp., Easton, Pa., safety nuts, $349,000 for machinery, repay mortgages.

C.G.S. Laboratories, Inc., Stamford, Conn., electronic instruments, $35,128 for machinery.

Schwien Engineering Co., Los Angeles, gyroscopic flight instruments, $398,500 for new plant building.

Electronic Associates, Inc., Long Beach, N. J., electronic devices Signal Corps, $150,000 building, equipment.

Industrial Research Laboratories, Baltimore, electronic, radar systems, $75,000 for research.

Aircraft Products Co., Clifton Heights, Pa., aircraft accessories, ground handling equipment, $175,000 building, equipment.

Ledoux & Co., N.Y.C., tests ores, metals, materials, $250,000 for building, equipment.

Mifflin Mining Co., Inc., Mifflin, Wis., new firm for zinc mining, $80,000 to operate zinc mine, flotation plant.

Lucerne Coke Co., Indiana, Pa., oven coke, $2,200,000 for land, build coke ovens.

Lead, Zinc Contracts Signed; U.S. Pays Half of Exploring Cost

The government's financial inducement to encourage exploration for new minable deposits of lead and zinc in the Upper Mississippi Valley Region of Wisconsin, Illinois and Iowa has yielded three more contracts. They were approved by the Defense Minerals Administration under the plan offering 50 pct of the cost for exploratory lead-zinc work.

Contracts have been signed with: Calumet & Hecla Consolidated Copper Co., Calumet, Mich., for a $158,518 project; Vinegar-Hill Zinc Co., Platteville, Wis., $45,704 (only 35 pct of cost will be contributed by the United States), and the Dodgeville Mining Co., Madison, Wis., $10,000.

DMA has signed contracts for 48 projects in 14 states since June 30, 1951. Before the fiscal year ended, the 3-month-old minerals exploration program of DMA involved total spending of $3,735,385 by both the U. S. and industry.

Firm's Titanium Lab Work Yields $1 Million Forging Orders

Titanium forging has left the lab. Steel Improvement & Forge Co., Cleveland, has fattened its order books with over $1 million for forged titanium parts. Identity of customers and end-uses is hush-hush but Steel Improvement gives itself a pat on the back for a job well done in research. Witness the outgoing orders as evidence.

The still scarce metal is important in defense applications because a titanium forging vies in strength with stainless steel and weighs but a little more than aluminum. The ore is plentiful and widely-scattered but refining has been expensive and intricate.

Alcoa Financial Report

Aluminum Co. of America and subsidiaries reported sales and operating revenues of $276,611,212 for the 6 months ended June 30. Consolidated net income was $25,411,848.

FOR SMALL JOBS: Forty-seven in. tall, Harold Kirkendall, 31, is shown perched on the afterburner of J-47 turbojet engine. Advantage of small size enables him to get into tail sections and afterburners to make general inspections, eliminating disassembling of the sections before inspection.

Keep Plane Schedules Aloft With More Machine Tools, Forgings

New aircraft output chief Boyer says bottlenecks must be pried open.

The sky will be full of jets and bombers if General Motors' Harold R. Boyer, new Deputy Administrator for Aircraft Production, can pry open stubborn bottlenecks in machine tools and alloy and aluminum heavy forgings.

Special attention went to aircraft output because June shipments to the Air Force had slipped a notch below May. But Mr. Boyer made it plain that he was interested first in the long-term aspects of production. Machine tool output would have to be increased and more forging capacity must be put up for heavy aluminum and alloy steel forgings, he said. Price America has to pay if these aims are not followed through will be tripping up of the jet engine program.

Stall and Dodge—Washington stall and dodge tactics on legislation to help machine tool output grow with defense has resulted in this impasse. Other crucial defense programs may soon come up with the same machine tool complaint when production schedules falter. But machine tool builders have not yet been given one real incentive to push production.

Boyer said that the June slip-up in deliveries was partly caused by completed aircraft being held back because individual parts were lacking. The forging and machine tool deficit will grow increasingly serious with the coming great buildup of plane output. Although the auto industry may be able to give "limited" help in machine tools, the onus will go to regular builders, he said.

A trip to plane centers will be taken by Boyer in a try to eliminate drawbacks. Costs of military plane production will account for 48¢ out of every defense dollar in the next 12 months.

Retain Labor Board Chairman

U. S. Steel Co. and United Steelworkers of America (CIO) have agreed to retain Sylvester Garrett as temporary chairman of the Board of Conciliation and Arbitration, which has the final say on grievances appealed to arbitration. Mr. Garrett was hired for a 60-day period beginning Aug. 1.

SUBCONTRACTS—If Hot Air Could Help . . .

Small business getting more than its share of political speeches . . . Payoff is in orders . . . Big contracts go to prime contractors at about World War II rate—*By Bill Packard.*

If hot air could help small business the little companies would be riding high. But, unfortunately, the payoff is in orders. Of them, the little guys aren't getting a fair share.

Meanwhile, the politicians are having a field day making political statements on a subject they know is popular to many ears. At the same time the big contracts are being placed with the big companies in about the same ratio as they were during the last war.

Same as Before—The Senate Small Business Committee has come up with an interesting study showing the concentration of prime defense contracts. During the period from July 1, 1950, to June 1, 1951, the 50 top companies had received 64 pct of prime defense contracts and letters of intent. From June 1940 through September 1944 the first 50 companies had received 57.6 pct. The parallel is obvious.

The committee admits that the hard core of major procurements, such as planes and tanks, must be undertaken by large firms. But they insist that the bigger companies have received many contracts which could be filled satisfactorily by other suppliers. And they conclude that there is no assurance defense work will filter down to smaller companies through subcontracts.

Whose Fault? — This report does a good job of calling attention to a problem that is already well known. But it doesn't analyze why the problem crops up in each emergency. Nor does it recommend specific actions which should be taken to remedy the problem.

That leaves us about what we started with—hot air. What small business needs is more orders.

Certainly, the fault is not with big business, nor with small business. The government, itself, is to blame. The avowed policy to spread defense business to small firms is clear-cut. Congress wrote it into the Defense Production Act. Secretary of Defense Marshall ordered it in a directive. But the chasm between policy and action hasn't been bridged. There is still no concrete course of action that has been adopted to assure the little fellows a fair share.

Gap Will Narrow—But the picture isn't entirely black. Two factors independent of government action (or failure to act) will narrow the gap between the shares of big and small companies. The weight and type of orders being placed will cause them to be spread among more firms. Also, a lot more subcontracts will be let as tooling is completed.

Subcontracting is still the best bet for the little company. Unfortunately, the government has failed to recognize this as well by deed as by word. They did urge meetings between prime and potential subcontractors, such as the Air Force Shows. But the resulting business has not matched the accompanying fanfare.

Incentive Needed — Present price regulations do not provide incentive for letting subcontracts. The machine tool builders have emphasized this repeatedly. Furnishing an incentive for subcontracting would provide a line of action to match the government's oft' spoken policy. Meanwhile the small firm waits.

No one can blame large firms for not subletting some of their defense business if it isn't economic for them to do so. Yet, in many instances, costs of subcontracting are considerably higher than if the work is done by the prime contractor. Industry has not stopped urging Washington to recognize this by providing incentives.

Path of Prime Contracts
July 1, 1950-June 1, 1951*

Company	Dollar volume of defense contracts	Cumulative percent of total
1. General Motors Corp.	$3,500,000,000	
2. Ford Motor Co.	1,000,000,000	
3. Boeing Airplane Co.	960,000,000	
4. Curtiss-Wright Corp.	840,240,000	
5. Lockheed Aircraft Corp.	674,300,000	
6. Republic Aviation Corp.	549,040,000	
7. General Electric Co.	500,000,000	
8. United Aircraft Corp.	490,000,000	
9. North American Aviation	481,897,000	
10. Grumann Aircraft Engineering Corp.	410,000,000	40
11. International Harvester Co.	355,000,000	
12. Western Electric	343,000,000	
13. McDonnell	269,000,000	
14. Bendix Aviation Corp.	265,000,000	
15. Westinghouse Electric and Mfg. Co.	245,000,000	
16. American Locomotive Co.	229,000,000	
17. Chrysler Corp.	223,417,000	
18. American Woolen Co., Inc.	208,284,000	
19. Allis-Chalmers Manufacturing Co.	200,000,000	
20. Packard Motor Car Co.	199,500,000	50
21. Sperry Corp.	198,000,000	
22. Nash-Kelvinator Corp.	192,000,000	
23. Douglas Aircraft Co., Inc.	172,129,000	
24. Consolidated Vultee Aircraft Co., Inc.	152,500,000	
25. J. P. Stevens & Co., Inc.	151,900,000	
26. Firestone Tire and Rubber Co.	142,041,000	
27. Fairchild Engine & Airplane Corp.	127,154,000	
28. Bethlehem Steel Co.	127,056,000	
29. Bell Aircraft Corp.	125,092,000	
30. Food Machinery & Chemical Corp.	125,000,000	56
31. Willys-Overland Motors, Inc.	124,350,000	
32. Avco	122,000,000	
33. Newport News Shipbuilding Co.	120,400,000	
34. Northrup Aircraft, Inc.	119,144,000	
35. Glenn L. Martin Co.	108,900,000	
36. Radio Corp. of America	108,560,000	
37. Goodyear Tire & Rubber Co.	108,000,000	
38. American Car & Foundry Co.	105,000,000	
39. Raytheon Manufacturing Co.	103,500,000	
40. Studebaker Corp.	97,845,000	61
41. Beech Aircraft Co.	86,000,000	
42. Standard Oil of New Jersey Affiliates	82,000,000	
43. Emerson Electric Manufacturing Co.	75,000,000	
44. Kaiser-Frazer	65,550,000	
45. Caterpillar Tractor Co.	65,000,000	
46. Baldwin Lima Hamilton Corp.	65,000,000	
47. United States Rubber Co.	64,000,000	
48. Diamond Motor Car Co.	55,000,000	
49. United States Steel	55,000,000	
50. Eastman Kodak Co.	44,694,000	64

* From a Small Business Committee survey on prime defense contracts, letters of intent.

INDUSTRIAL BRIEFS

New Lab—NATIONAL TUBE CO. has established a new laboratory in Pittsburgh for testing materials and for conducting research into metallurgical problems. The lab building consists of three stories and a basement.

Westinghouse Installations—Westinghouse Electric Corp. will install more than $3 million in electrical equipment at the new aluminum plant being built at Wenatchee, Wash., by ALUMINUM CO. OF AMERICA. The contract includes 24 ignitron rectifiers for converting ac into dc.

In Operation—HUDSON BAY MINING & SMELTING CO. has started one of the two furnaces in its zinc fuming plant on steady production and the second will be brought into operation soon. The new zinc process will boost the company's annual zinc output by 30 million lb to 130 million lb a year.

Steamer Renamed—M. A. HANNA CO., Cleveland, has changed the name of the steamer "Fred G. Hartwell" to "Matthew Andrews" in honor of Matthew Andrews, who was chairman of the board of the Hanna organization from 1922 until his death in 1929.

New Acquisition—COPCO STEEL & ENGINEERING CO. has acquired all of the outstanding stock of Edwards' Iron Works, Inc., South Bend, Ind. Edwards' manufactures commercial freight trailers and is a steel fabricator.

Name Changed — Newhall-Marshall-Wood, Inc. has changed its company name to MARSHALL RAILWAY EQUIPMENT CORP., New York. As a result of a general reorganization the new name more clearly identifies the services of the company.

Debit Purchases — CONTINENTAL CAN CO. has purchased for cash the entire capital stock of DIXON MFG. CO., INC., Coffeyville, Kan., contract makers of aircraft components.

Special Notice — Reconditioning of any NESCO, INC., roaster-oven which was damaged by flood waters in Kansas City, Missouri, area, will be done free of charge by the company.

Down Under Rep.—Dalhoff & King, Wellington, New Zealand, has signed a contract with WORTHINGTON PUMP & MACHINE CORP. to handle their well pumps, welding positioners, multi-V drives, road construction equipment and YC compressors, in New Zealand and the Fiji Islands.

Contract Awarded—Republic Steel Corp. has awarded GEORGE J. HAGAN CO., Pittsburgh, a contract for a rotary hearth billet heating furnace for a new seamless mill at S. Chicago. The furnace will be completely automatic from billet storage table to piercer inlet.

GETTING A LIFT: A 10-ton coil of strip steel is being lifted by specially-designed tongs at the Rouge plant of Ford Motor Co. Developed by Heppenstall Co., the tongs eliminate need of ground crew to fasten load. Signalman is spotting location for the craneman.

Coke Oven Contract—Koppers Co., Inc., Pittsburgh, will build a new battery of 13 chemical-recovery coke ovens for PACIFIC STEEL CO. OF CHILE, at its plant near Huachipato, Chile.

Ground Broken—Ground has been broken for ALABAMA POWER CO.'s $30 million steam electric power plant at Salco, Ala. In 18 months the new plant is expected to supply 250,000 kw power to the southern section's industries.

Expansion Program—A $20.8 million expansion program by GENERAL MOTORS CORP. for its Chevrolet Motor Div. in Tonawanda, N. Y., calls for the erection of three new buildings with nearly a million feet of floor space. The new facilities will augment the division's production of Wright R-3350 aviation engines for the Air Force and Navy.

Division Formed—CURTISS-WRIGHT CORP. has formed a new metals processing division to make essential materials and products for aircraft. The corporation purchased the former plant of the Buffalo Stainless Castings Co. for approximately $565,000 to house the division.

Terms Agreed—Texas Eastern Transmission Corp. has awarded OMAN CONSTRUCTION CO. a contract for the construction of 79½ miles of 30-in. pipeline from the Cumberland River in northern Tennessee, to a point near Columbia, Ky.

U. S.-Canadian Agent — GENERAL INDUSTRIAL DEVELOPMENT CORP., New York, has been appointed exclusive agent in the U. S. and Canada for Bamag-Meguin, A. G., manufacturers and designers of industrial process equipment.

Industrial Directory — SOUTHERN ASSN. OF SCIENCE & INDUSTRY has begun compilation of a Southwide industrial directory. To be published in book form within a few months, the volume will list major manufacturing plants, their key personnel, principal products, etc. Several thousand copies will be distributed gratis and additional copies will be sold at nominal cost.

Under Construction — CLEARING MACHINE CORP., Chicago, has purchased a 27-acre tract of land in Joliet, Ill., where it will erect a new factory with about 32,000 sq ft of working space. Construction has started and completion is expected early in 1952.

Second Contract — A. O. SMITH CORP. was awarded a second contract by the Boeing Airplane Co., Seattle, to manufacture parts for military aircraft. Under the new contract the company plans to lease a plant in Rochester, N. Y., from the U. S. Air Force.

NPA VIOLATIONS—Clear Path for Court Action

Start Compliance Court . . . W. H. Foster is head . . . To hear cases at violation site . . . Justice Dept. to get some cases . . . Charge Ender Mfg. Co. with illegal sale of sheet steel.

Charges that National Production Authority orders and regulations have been violated will be heard and acted on by a recently-created "compliance court" headed by Walter H. Foster, chief hearing commissioner for NPA.

Commissioners are to be recruited from the ranks of judges, law school professors, and practicing attorneys. Foster, a Boston attorney and former chief compliance commissioner of the War Production Board, and deputy chief hearing commissioner Morris R. Bevington.

Two Courses—Some alleged violations of NPA orders will be referred by NPA's general counsel to the Dept. of Justic for handling. Others will be turned over to a hearing commissioner appointed by the agency's administrator.

Commissioners will hold public hearings in communities where alleged violations occur. If no violation is proved by the government, a commissioner may order the case closed. On the other hand, if the facts appear to warrant such action, he will issue a suspension order to: (1) Withdraw or withhold priority assistance from a company; (2) withdraw or withhold allocations or allotments of materials or facilities; or (3) prohibit a company from using certain materials or facilities.

A suspension order may be appealed to an NPA appellate commissioner in Washington.

NPA chief Manly Fleischmann, meanwhile, charged a New York businessman with criminal violations of NPA orders—the first such case since defense mobilization began.

Against Ender Co.—Prosecution was instituted against the Ender Manufacturing Co., of New York, and its president, Jules Levenstein, for alleged private sale of steel sheets which the company had been allotted by NPA for specific defense production.

Fleischmann says Levenstein faces a maximum penalty of 12 years in prison and a $120,000 fine if found guilty on each of the 12 counts filed against him and the company in Federal Court.

NPA says the Ender Co., which makes fluorescent lighting, got 458,910 lb of steel sheets on a priority rating which applies to Atomic Energy Commission operations. The agency says the steel was to fill defense orders which required 333,916 lb, but Levenstein got the larger amount by saying he would need all of it to fill the order. The charge then states that Levenstein and the company sold 20,790 lb of the steel at 17¢ per lb ($340 per ton).

NPA Starts CMP Probe

A nationwide investigation of how steel, copper, and aluminum users comply with CMP regulations was started this week by National Production Authority. Agents will check whether firms have cancelled or adjusted outstanding orders to stay inside allotments. They will audit records to see if firms adhere to authorized production schedules, place orders within CMP allotment of materials, and don't hold extra inventory.

A cross-section of 100 industries and trades will be studied. No advance notice will be given. Firms should ask for credentials of investigators.

Companies under CMP should have records of: (1) The material being accounted for, (2) identifying program information, (3) the unit of measure, (4) the calendar quarter for which it is valid, (5) quantities received, (6) quantities reallotted to other consumers, (7) quantities ordered direct from suppliers, (8) the allotment balance available, and (9) dates and posting references. Separate records must be kept for each allotment identification, for each controlled material, and for each calendar quarter.

Industry Controls This Week:

NPA Orders

M-76—Specifies allocations of available soft pig lead and establishment of limitations to assure equitable distribution. Effective Sept. 1.

M-77—Provides authority for communications companies to apply DO ratings to orders for maintenance and expansion with greater ease.

M-67, Amend.—Regulation covering aluminum foil has been broadened to include all types except insulation foil. Establishes quarterly quotas instead of monthly quotas. Adds new groupings to cover use programs formerly in M-7 and sets up minimum of 60 days working inventory.

CMP Reg. 1, Dir. 5—Purchasers of controlled materials not receiving full amounts ordered in second quarter are not in danger of having undelivered quantities deducted from third quarter allotments. Applies whether materials were ordered on basis of authorized CMP, rated, or unrated orders.

M-47A, Dir. 2—Manufacturers of consumer durable goods whose use of controlled metals in the second quarter was on adjusted base period figures will continue using these adjustments in computing third quarter allowances.

M-19, Amend.—Increases amount of cadmium permitted for less essential purposes to 60 pct of base period consumption. The 30-day inventory period may also be exceeded under certain conditions.

OPS Orders

GCPR, SR 46—Authorizes a 3¢-per-lb increase in domestic sales of refined copper containing imported raw materials. Effective July 25.

ALLOCATIONS—Deep Cuts for Civilian Goods

Basic metals allotments for fourth quarter will hit auto and civilian output hard . . . NPA says it will have 21,336,000 tons of steel for final quarter . . . Lists production cuts.

Government allocations of steel, copper, and aluminum for the fourth quarter are now officially slated to bring drastic cuts in automobile and other civilian goods production.

National Production Authority said in fixing fourth-quarter allotments of controlled materials that it expects to have 21,336,000 tons of steel available for distribution to all comers, as compared with 20,800,000 tons in the current quarter.

Automobile manufacturing is slated for a 5 pct slash. This brings the total cut to that industry to 40 pct below pre-Korea. A total 35 pct cut faces manufacturers of other consumer durables such as refrigerators, washing machines, TV sets, and furniture.

Expected Output—NPA says the new cut for autos will permit production of "somewhat more than 1,100,000 cars" in the final quarter of this year. Currently, the industry is producing at the rate of 1,200,000 units for the quarter.

Of total steel supplies expected to be available, NPA has earmarked 1,946,000 tons for Defense Dept. projects; 183,000 tons to the Atomic Energy Commission, and the great bulk of the remainder to defense-supporting industries.

During the next 12 months, NPA predicts, military hard goods deliveries are slated to rise from a monthly rate of about $1 billion to about three times that amount. Aircraft deliveries are to be tripled, and the tank-automotive program increased to four times the present rate of deliveries.

Demand and Supply—While over-all coverage of demand for carbon steel amounted to 147 pct of supply, in the case of structural shapes the demand was for 223 pct of what will be available in the fourth quarter, NPA reports. Average demand for copper and copper-base alloys is about 170 pct of supply, and that for aluminum is 145 pct.

NPA says fourth-quarter allotments are, in general, "more precisely matched" with supply than are those for the current quarter.

CMP ALLOTMENTS—FOURTH QUARTER

Claimant Agency and Program	Total Steel (Tons)	Total Copper, Base Alloys (000 Lb)	Total Aluminum (000 Lb)
Estimated Supply	21,336,000	1,166,000	598,000
Program Allotments			
Secretary of Defense	1,946,000	205,800	168,000
Secretary of Army	32,634	1,260	300
AEC	183,403	7,160	7,559
Fed. Security Agency			
Education	94,614	2,881	15
Hospitals	71,299	2,190	500
GSA	19,920	600	225
Veterans Admin.	11,041	501	400
Housing & Home Fin. Agency	183,000	17,457	500
Sec. of Agriculture	127,400	8,490	2,200
Secretary of Interior	10,000	256	37
Defense Solid Fuels Admin.			
Coal Mining	25,615	215	31
Coke Ovens	18,135	535	70
Defense Elec. Power Admin.	289,176	80,852	35,500
Defense Minerals Admin.	41,395	1,435	140
Petr. Admin. for Defense	1,806,500	7,975	785
Defense Transport Admin	83,000	1,700	300
Maritime Admin.	103,000	4,455	350
Bureau of Public Roads	250,050	1,150	520
Civil Aeronautics Admin.	6,190	741	20
NPA Industry Div.			
Agriculture Mach. & Imp.	528,400	8,500	5,800
Aircraft	15,639	1,148	7,950
Aluminum & Magnesium	12,850	...	3,800
Building Materials	1,016,100	45,900	50,000
Chemicals	...	1,000	8,135
Communications Equip.	39,453	53,090	2,900
Construction Mach.	503,450	4,340	2,000
Consumer Dur. Goods	867,000	49,050	57,000
Containers & Packaging	1,615,216	271	17,900
Copper	43,140	2,525	11,000
Electrical Equip.	571,530	148,700	27,000
Electronics	72,550	33,385	15,750
Engine and Turbine	461,600	15,070	2,600
NPA Facilities Bureau (Industrial & Commercial Construction, etc.)	653,725	7,100	22
General Components	1,067,500	150,094	14,700
General Industrial Equip.	866,500	61,020	25,400
Iron and Steel	347,100	1,650	29,000
Leather and Leather Prods.	14,000	425	700
Lumber and Lumber Prods.	10,236	100	1,200
Metalworking Mach. Equip.	643,500	25,080	7,900
Mining Mach. & Equip.	95,000	2,595	225
Misc. Metals & Minerals	1,800	837	10
Motion Picture-Photo Prods.	8,320	1,420	3,750
Motor Vehicle	3,464,300	147,800	92,300
Ordnance & Shipbuilding	167,212	8,015	1,300
Printing & Publishing	3,788	1,702	375
Pulp, Paper, Paper Board	1,000	5	50
Railroad Equip.	1,872,425	64,355	8,500
Rubber	33,715	3,342	475
Scientific & Tech. Equip	47,500	35,600	10,000
Service Equip.	46,850	2,800	3,750
Tin, Lead, and Zinc	...	10	3,000
Water Resources	164,950	4,050	175
Exports (ECA-OIT)	676,000	9,825	2,450
Canada	343,625	2,750	2,270
Allowance for Maintenance, Repair and Operating Supplies	1,312,150	26,884	3,050
Reserves for Program Adustment and Self-Certification	1,171,015	59,850	31,900
Total Allotments	24,058,520	1,325,941	681,475

NPA Offers Guide on How To Figure Third Quarter Allowances

Manufacturers of consumer durable goods covered by National Production Authority's order M-47A will continue using adjusted base period figures in computing third quarter allowances. Direction 2 to NPA's M-47A, governing use of steel, copper, and aluminum, specifies the following guide for third quarter planning: A manufacturer may have used, during the base period, 1000 lb of copper, of which 200 lb, or 20 pct, went into consumer durables. Since that time the base period figure may have been raised to 1200 lb by NPA. The manufacturer then will compute 20 pct of 1200, or 240 lb, in order to arrive at his permitted use of copper under M-47A in the third quarter.

Continued

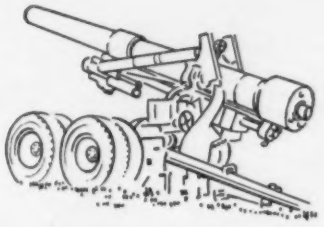
DEFENSE CONTRACTS

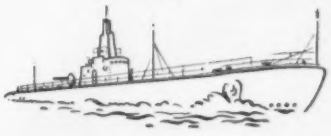
Week of July 30, 1951

Field range spare parts—Malleable Iron Range Co., Beaver Dam, Wis.
Scales—Detecto Scales, Inc., Brooklyn
Sealing machines—Ralph Chaffee & Co., San Francisco
Generator spare parts—The Hobart Bros. Co., Troy, Ohio
Cable assy.—U. S. Rubber Co., Phila.
Monarch lathes—Machinery Associates, Phila.
Aircraft valves—Saval Div. of Wm. R. Whittaker Co., Ltd., Los Angeles 58
Pump assy.—Thompson Products, Inc., Cleveland
Spare parts—Link Aviation Inc., Binghamton, N. Y.
Combustion heater—Stewart-Warner Corp., Indianapolis
Door locks—The Eagle Lock Co., Terryville, Conn.
Shock assy.—Bendix Aviation Corp., South Bend, Ind.
Signal generator—Lavoie Labs. Inc., Morganville, N. J.
Aluminum desk—Western Metalcraft Inc., Olympia, Wash.
Rivet sets—Delaware Tool Steel Corp., Wilmington, Del.
Actuators—Airborne Accessories Corp., Hillside, N. J.
Bomb truck—American Chain & Cable Co., Inc., York, Pa.
Tools & test equipment—Bendix Aviation Corp., Teterboro, N. J.
Bomb truck—Lewis-Shepard Products, Inc., Watertown, Mass.
Lockers—Western Metalcraft, Olympia, Wash.
Test equipment—General Electric Co., Phila.
Headset—Permoflux Corp., Chicago
Winch—All American Airways Inc., Wilmington, Del.
Oscilloscopes—Lavoie Labs., Inc., Morganville, N. J.
Locomotive, diesel—Davenport Locomotive Works, Davenport, Iowa
Locomotive, diesel—General Electric Co., Schenectady
Locomotive spare parts—Cummins Engine Co., Inc., Columbus, Ind.
Railway crane—Industrial Brownhoist Corp., Bay City, Mich.
Anchor shackle—Midland Industries, Inc., Cedar Rapids, Iowa
Cartridge case—Wilson Foundry & Machine Co., Pontiac 11, Mich.
Tank-automotive parts—Lapton Machine Tool Co., Hazel Park, Mich.
Automotive parts—S. J. Corbett Co., Detroit
Ammunition cans—National Can Corp., New York
Motors—The W. L. Maxson Corp., New York
Periscopes—Rudolf Wendel, Inc., New York
Telescopes—American Cystoscope Makers, Inc., New York
Gun director spare parts—Western Electric Co., New York
Range finders—Mergenthaler Linotype Co., Brooklyn
Compressors—Cornelius Co., Minneapolis, Minn.
Milling machines—Van Norman Co., Springfield, Mass.
Dolly assy.—Boeing Airplane Co., Seattle
Generator sets—Beech Aircraft Corp., Wichita, Kansas
Portable heaters—Airesearch Mfg. Co., Los Angeles
Generator sets—Continental Electric Co., Inc., Newark, N. J.
Power plants and spare parts—Fairchild Engine & Airplane Co., Farmingdale, N. Y.
Tanks—North American Aviation Inc., Los Angeles
Indicators—Eclipse-Pioneer Div., Teterboro, N. J.
Indicator—Sperry Gyroscope Co., Great Neck, N. Y.
Stand assemblies—Airquipment Co., Burbank, Calif.
Gun chargers—Rudolph Wurlitzer Co., North Tonawanda, N. Y.
Transmitter—U. S. Gauge Div., Sellersville, Pa.
Turbo jet engines—General Electric Co., Schenectady
Heater—Heppner Mfg. Co., Round Lake, Ill.
Propeller dolly—Welded Construction Engineering Co., Cleveland, O.
Fuel pump—Gorham-Rupp Co., Manfield, Ohio

DEFENSE CONTRACTORS

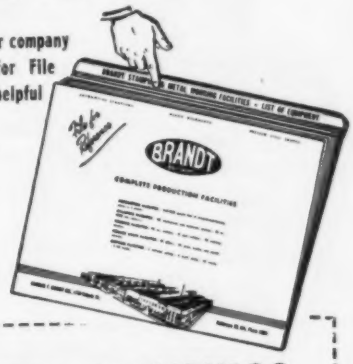
ENLIST BRANDT'S ASSEMBLY LINES FOR PRIME AND SUB-CONTRACTS*





- Brandt has the right combination of facilities and experience to assure dependable, on-time deliveries of component parts on prime defense contract work regardless of size or quantity. Brandt's two modern plants are equipped for mass production of metal stampings, heavy weldments, general fabrication and complete assemblies . . . *at your command!*
- Proximity to steel mills and rail and water transportation assures on-time delivery.
- **Regardless of stepped up defense production, our industrial accounts still receive prime consideration.*

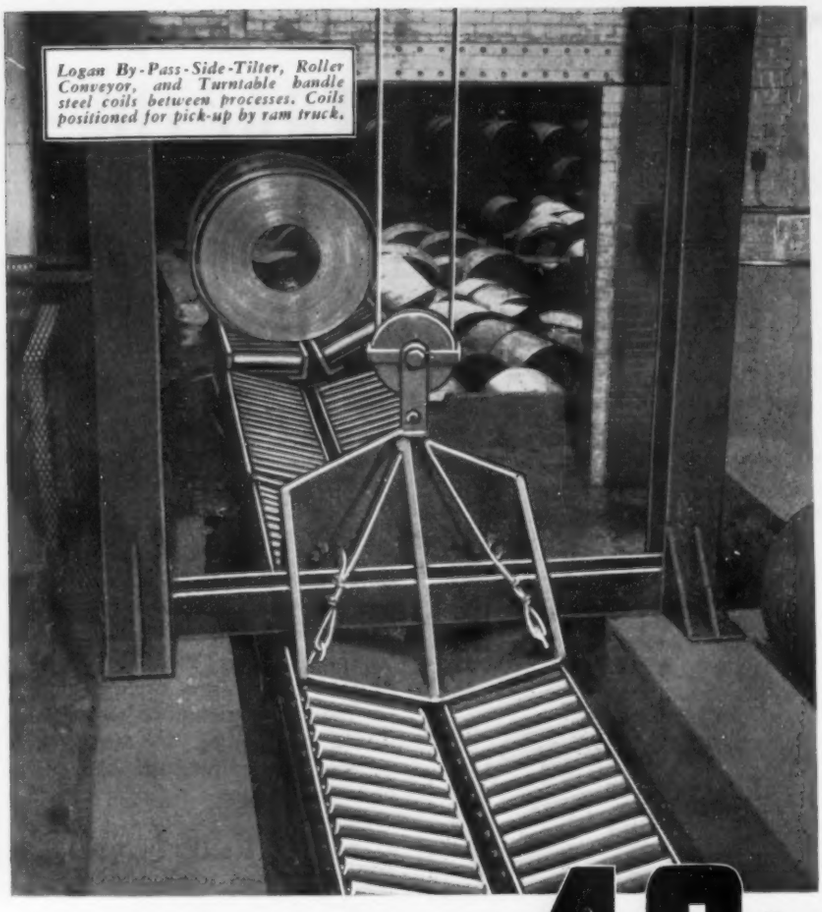
Write, on your company letterhead, for File No. 503 of helpful working information.



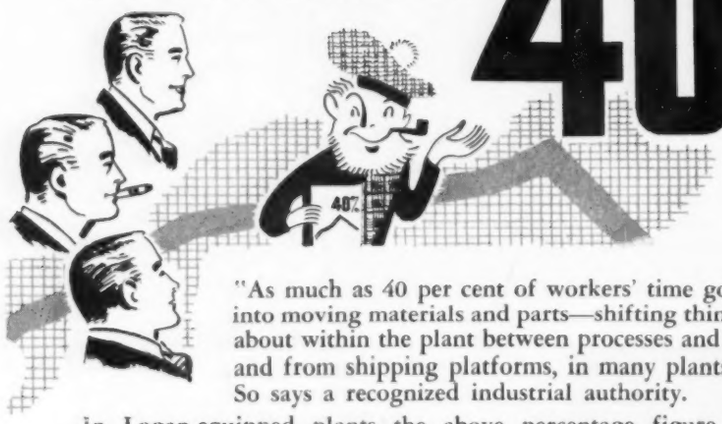
METAL STAMPINGS
HEAVY WELDMENTS
PRESSED
STEEL
SHAPES

CHARLES T. BRANDT, INC.
1700 Ridgely St.
BALTIMORE 30, MD.

BRANDT
BALTIMORE


Logan By-Pass-Side-Tilter, Roller Conveyor, and Turntable handle steel coils between processes. Coils positioned for pick-up by ram truck.

WASTE BEGINS AT 40%



"As much as 40 per cent of workers' time goes into moving materials and parts—shifting things about within the plant between processes and to and from shipping platforms, in many plants." So says a recognized industrial authority.

In Logan-equipped plants the above percentage figure is reduced nearly to the vanishing point. Perhaps your plant, too, can utilize Logan Conveyors to (a) deliver material to operators at convenient working height (b) keep equipment operating at capacity (c) save time and effort between processes.

Write today for literature or for an engineer to call. Remember, there are two generations of conveyor experience back of every Logan installation.

CONCAVE ROLLS available for handling shells and shell casings

Logan Conveyors

75th Anniversary 1876-1951

LOGAN CO., 545 CABEL ST., LOUISVILLE, KY.

NPA Plans to Ask Auto Industry to Build Machine Tools

A stronger stand on machine tool production in order to remove one of the most serious bottlenecks in the manufacture of defense items will be taken by National Production Authority.

The new plan expected is to ask the automotive industry to build complete tools. This idea is at variance with the views of some auto manufacturers, who have advocated that their plants be allowed to build parts and component items needed in the tools.

Representatives of the auto industry were in Washington recently to offer NPA assistance in construction of component parts. They indicated to federal officials that, if they were to help relieve the machine tool shortage, the following would be needed:

(1) Data on the types and quantities of machine tools and parts required for defense production.

(2) A "satisfactory clarification" of machine tool pricing policies.

(3) An indication from the Defense Dept. on the relative urgency with which various types of tools are needed.

Getting Sore — Machine tool pricing has incensed a number of tool builders, who complained in Washington that the latest formula is not "realistic." Builders say the recent regulation — General Overriding Regulation 15—bases earnings on assets rather than unit production, thus failing to "provide incentive for further production. . ."

Spokesmen for Office of Price Stabilization say the formula does base earnings on assets, but they see the regulation as a very liberal one in that it permits profits amounting to 80 pct of the average rate of return during the base years 1938-48. Anything above 80 pct, these officials say, is fair game for excess profits taxes.

A changed pricing formula was only one of the recommendations

made by machine tool builders to NPA officials. The former, who said that if industry could double its machine tool output in the next 12 months, production would still lag behind needs of the mobilization program. They also asked:

(1) "Super-priorities" for materials, facilities, and tools.

(2) Additional skilled labor, and guarantees that their workers would not be pirated.

(3) "Adequate financing" to pay for expansion and create greater working capital.

All the foregoing requests have been considered by NPA, but the agency has made no promises to accord special treatment to the builders.

Ask Better NPA Nickel Planning

Consumer durable goods manufacturers are urging the National Production Authority to tell their industry in advance how much nickel it may expect to receive.

The industry says current NPA programming does not permit it to plan production more than 4 to 5 weeks in advance. It is asking a lead time of from to 3 to 5 months, depending on the shape and form of nickel required.

NPA coordination of nickel allotments with steel, copper, and aluminum allocations also is sought by the industry.

Will Alter Plant With RFC Loan

Reconstruction Finance Corp. has agreed to lend $425,000 to Dolite Co., of Toledo, Ohio, manufacturers of dead-burned dolomite. RFC says the other half of the $850,000 sought by the company will be supplied by banks.

Dolite intends to use the borrowed funds for construction and alterations in its plant, and for acquisition and installation of machinery, according to RFC.

The agency also has agreed to lend $400,000 to Douglas Tool Co., of Detroit, for working capital and plant expansion. A $200,000 loan previously approved and then withdrawn is included in the new total.

How good management solved lost-time problem

Case No. 217—Problem: In handling wire products in 120°-180° chromic acid solution, heaviest rubber gloves frequently snagged and flooded, exposing employees' hands to hot acid and sharp wire edges. High injury rate and job dissatisfaction.

Management Solution: Modern type gloves with extra heavy duty coating of NEOX (reinforced neoprene) bonded to strong fabric which prevented tearing. Eliminated flooding hazard and materially improved worker efficiency and comfort (fabric lining absorbed sweat, insulated from heat, made gloves easy to slip on and off).

Change-over also saved up to $11 per man per week by greatly reducing glove replacement.

Safe hands lose no production time

We have case records of hundreds of industrial operations, handling all types of sharp, abrasive and slippery materials with and without the presence of heat, oils, acids, caustics, solvents, degreasants, where the proper selection of work gloves (supplied or recommended by management) has resulted in:

• Fewer lost-time accidents • Faster, surer work handling • Less spoilage • Improved job attitude • And 40% to 70% savings in usual glove costs to companies or employees who provide their own.

There's a correct glove for every job
Good management makes it available

Maximum Protection with Comfort, Freedom and Firm Grip

Extra heavy NEOX coating (reinforced neoprene, extremely resistant to cutting, abrasion, chemicals). Fabric lining prevents snagging, absorbs sweat, insulates, makes glove easy to wear. Non-slip grip. Many styles.

Heavy Weight or Flexible to Suit Work

Various types with NEOX (reinforced neoprene) coatings, over-all or on palm and thumb only. Fabric linings.

Non-Slip Natural Rubber Coated

Sure grip, wet or dry. Resist cutting, abrasion. Comfortable as canvas gloves but safer and wear 5 to 10 times longer.

Vinyl Plastic Coated Work Gloves

Very resistant to abrasion, oils, many chemicals. Special plasticizers preserve their flexibility. In various styles.

We offer consulting service on specific problems or complete plant surveys: (Used by DuPont, Cadillac, RCA, Pittsburgh Plate Glass, International Harvester and many others.)

Without cost or obligation we will gladly study your hand-protection problems and practices, make recommendations and furnish the procedures and materials for complete on-the-job tests. For full information, write our Safety Engineering Service.

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NPA Shows a Little Optimism On Tool Steels Tungsten Supplies

National Production Authority is letting an edge of optimism show over supplies of tungsten to toolmakers. Following up on its report that tungsten reserves are being drained at a rate of 400,000 lb a month (THE IRON AGE, July 26, 1951, p. 87), NPA now says toolmakers will be able to count on enough of the element to meet their third-quarter needs. Catch is that production must not surpass current levels for this to happen.

NPA told the tool steel industry last week that the supply situation had improved. Reasons given were more domestic production, larger imports from friendly nations (China cut us off in 1949), and the industry's ability to use scheelite ore in tool steels.

The agency said it hoped for "early rehabilitation" of a South Korean tungsten mine and for favorable new monetary exchange rates with South American countries.

Less encouraging news was reported on cobalt and molybdenum availability. It has been suggested that manufacturers use "not more than" 5 pct cobalt in tool steels, utilizing the scarce metal primarily for cutting tools.

Molybdenum, it was asserted, will continue to be in short supply during the present quarter.

The outlook for vanadium, the Tool Steel Industry Committee was told, allows some reason for optimism. The supply is called "good," and production can be increased to meet heavier demands.

Chromium is still scarce, but there are indications that current-quarter needs will be met.

Still Room for Improvement

OPS says manufacturers of metal-cutting tools are generally satisfied with existing price controls over their products (CPR 30), but admits that recently-authorized wage increases and higher costs of tungsten carbide are squeezing profit margins.

Domestic Pig Lead Deliveries Will Be Restricted After Aug. 31

Allocations and limitations are covered in new NPA order M-76

Delivery of domestic soft primary pig lead may not be accepted by the user for any purpose, after Aug. 31, except in accordance with National Production Authority allocation authorization.

Allocation of available soft pig lead and establishment of limitations on acceptance are specified in order M-76 issued by NPA to assure equitable distribution of soft lead supply for defense and civilian needs.

The agency has amended order M-38 (lead) to remove all restrictions on distribution of lead and lead products, inasmuch as such limitations are incorporated in M-76. This amendment becomes effective Sept. 1.

Allocations and delivery prohibitions do not apply to (1) acceptance of the primary metal by General Services Administration for the strategic stockpile; (2) acceptance from a foreign source, and (3) acceptance of less than 10 short tons in a calendar month by a user who has not applied for an allocation authorization for that month.

Under M-76, no person is required to accept rated orders for pig lead (other than soft primary pig), lead-base alloys, or lead products received less than 15 days before the beginning of the month in which delivery is requested. Deliveries of soft primary pig may be made only in accordance with M-76.

Delivery of pig lead is prohibited when the potential supplier has reason to believe the requesting person or company is not permitted to receive the metal under this order or any other NPA regulation.

Named AEC Official

Donald H. Loughridge, formerly scientific adviser to the Army, has been named assistant director of the Reactor Development Div., Atomic Energy Commission.

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• Free of Underbead Cracks

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As well as other low alloy steels of similar analysis.

For more information request • Booklet—ABC's of Welding High Tensile Steels • Selector Chart 9501—Welding Trade Named Steels.

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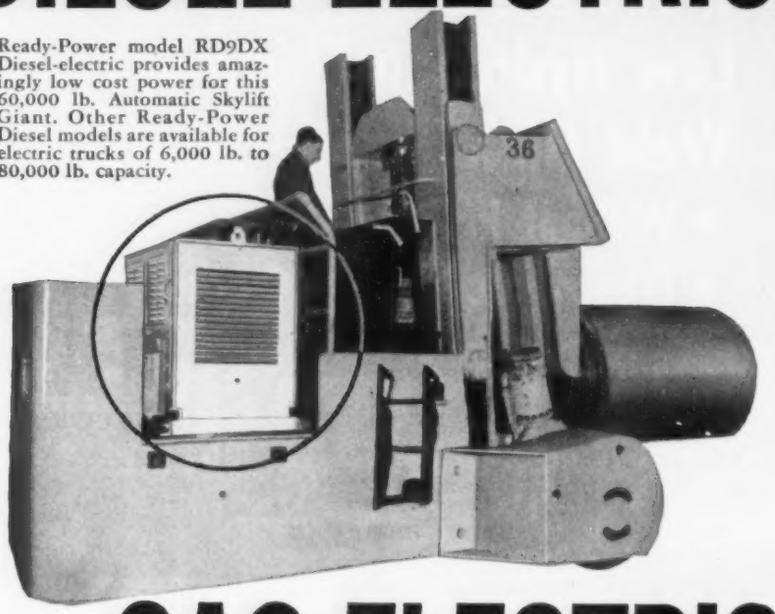

Ready-Power model RD9DX Diesel-electric provides amazingly low cost power for this 60,000 lb. Automatic Skylift Giant. Other Ready-Power Diesel models are available for electric trucks of 6,000 lb. to 80,000 lb. capacity.

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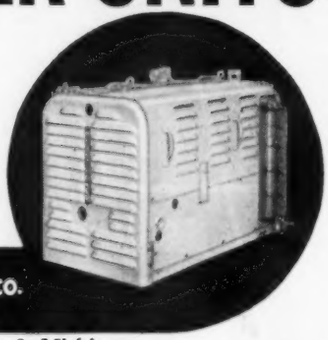

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Continued

Communications Industry Put In Better Spot to Get Materials

Radio, telephone, and wire branches of the nation's operating communications industry will be able to obtain materials for maintenance and expansion with greater ease, it is predicted, as a result of the National Production Authority's new order M-77.

It provides: (1) Authority for communications companies operating on a revenue basis to apply DO ratings to orders for maintenance, repair, and operating supplies and operating construction materials.

(2) Exemptions for operators of small telephone companies, each serving fewer than 5000 stations, from controls on use of MRO materials.

(3) Emergency authority for an industry operator to use an allotment symbol or order to get materials to replace or repair equipment damaged or destroyed by flood, sabotage or disaster.

Increase in Rated Order Reserve

NPA has ordered producers of certain carbon and stainless steel products to increase their reserves for rated orders.

Percentages of products covered by the new instructions are calculated to fill orders placed under NPA directives, authorized controlled-materials orders, DO orders, and minimum required shipments to warehouses and converters.

Percentages will be based on the planned production for September and following months, provided this output is not less than average monthly production of the products in April and May.

Products affected, with old and new reserve percentages, are:

Carbon Steel Products	New Pct.	Old Pct.
Reinforcing bars	95	70
Nails and staples	95	90
Barbed and twisted wire	95	90
Wire Fence	95	90
Wire Mesh	95	75
Stainless Steel Products		
Ingots	100	75
Blooms, slabs, billets	90	50
Sheet bars	100	75
Hot-rolled strip	100	50

NPA Gives Supply Assurances To Alloy Warehouses, Converters

Shipment percentages set under new formula for calculating tonnages.

Warehousers and converters of certain stainless and alloy steel products now have NPA assurance that they will receive, beginning in October, specific and continuing shipments from producers.

Producers have been told they must calculate tonnages for shipment as a percentage of the quantities sent each month to warehousers and converters during the base period, Jan. 1-Sept. 30, 1950. As regards shipments to converters, these percentages apply: Stainless steel products (except tubing), minimum of 85 pct, at least 15 pct in nickel grades; stainless steel tubing, minimum of 85 pct, at least 80 pct in nickel grades; alloy cold-drawn bars, minimum of 100 pct, at least 25 pct in nickel grades; all other alloy products, minimum of 100 pct, at least 20 pct in nickel grades.

Revise Formula — Percentages for shipment to warehousers are the same for stainless steel products, including tubing. For commercial quality alloy steels, shipments must be 100 pct in any grades with a melting range of 70 pct maximum nickel, .15 pct maximum molybdenum (used individually or in combination, with or without chrome) and any American Iron & Steel Institute non-nickel and/or non-molybdenum bearing grades.

Twin Goals of Defense

Two industrial goals toward which defense is aimed, says Munitions Board Chairman John D. Small, are a combined delivery rate of military end items and construction activity of $4 billion per month, and creation of "the capacity to produce more and better munitions in the future."

Speaking before an Armed Forces Procurement clinic in Cleveland, Mr. Small estimated that industrial output had jumped more than 12 pct since Korea.

OVER ONE HUNDRED YEARS OF CONTINUOUS SERVICE. ROUNDS, SQUARES, FLATS, HEXAGONS, OCTAGONS

BILLETS AND FORGINGS FOR PRODUCTION, TOOL ROOM AND MAINTENANCE REQUIREMENTS.

Making
BEST USE OF AVAILABLE STEEL

In times of emergency, substitutes can often be used to good advantage.

Right now, the urgent requirements of production for national defense are taking the lion's share of high-grade alloying materials.

That is as it should be, of course. But the fact remains that many manufacturers are being confronted daily with knotty problems of production.

Frequently these difficulties can be solved by using substitute grades or alternate methods of manufacture and treatment.

To help you decide *which* substitute grades you can use and *how* you can use them most effectively, call on our staff of metallurgical experts.

A letter – or a phone call – will focus Wheelock, Lovejoy's specialized technical skill and long experience on your individual problems.

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Write today for your FREE COPY of the Wheelock, Lovejoy Data Book, indicating your title and company identification. It contains complete technical information on grades, applications, physical properties, tests, heat treating, etc.

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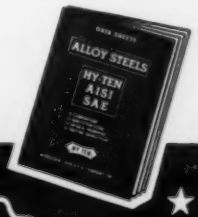

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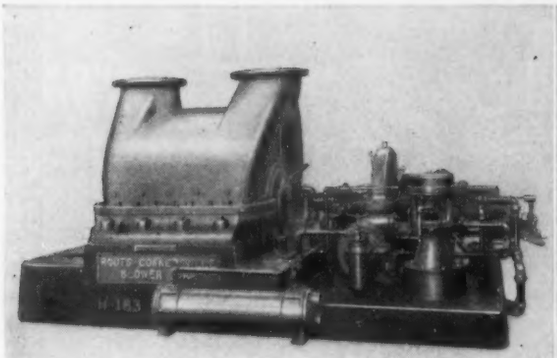

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A 4-Stage, Type H Gas Booster in steel plant operation. Capacity 7,000 cfm. Driven by 240-hp steam turbine.

You can't afford to risk shutdowns today because of unsatisfactory or inadequate equipment performance. To keep production moving at the required fast pace, calls for blowers or gas pumps that continuously deliver positive Volume at required Pressure—and at Low power costs to reduce operating expense.

You get these 3 essentials from R-C Blowers and Gas Pumps. Whether your needs call for Centrifugal or Rotary Positive units, we can match them from our exclusive *dual-ability line*. With capacities from 5 cfm to 100,000 cfm, you can usually find R-C units that closely fit your demands, with resultant savings in time, cost, space, weight and power.

From an experience of almost a century of blower building, our engineers will gladly make suggestions of the right R-C equipment to move or measure gas and air to keep production going.

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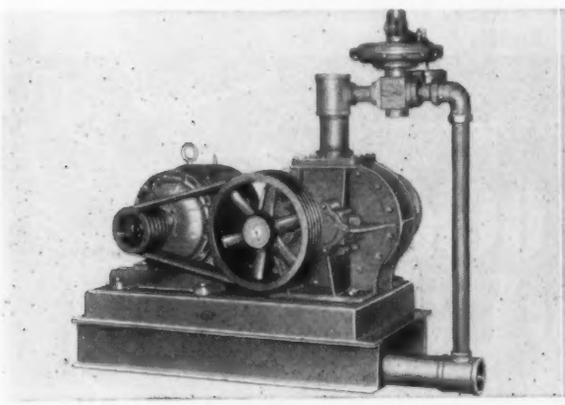

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STEEL CONSTRUCTION NEWS

New York—June bookings of fabricated structural steel, as reported to the American Institute of Steel Construction, totaled 207,966 tons, a drop of some 22% from the previous month, but 6% greater than the same month for the average four years 1947/1950 when 196,725 tons were reported. Bookings for the first half of this year amounted to 1,728,794 tons, an increase of 34% over 1950.

Shipments during June amounted to 257,066 tons, the highest reported to the Institute this year. Total shipments for the first six months were 1,370,372 tons, an increase of 28% over the same period last year when 1,074,711 tons were reported.

The backlog (tonnage available for future fabrication) for the next four months only amounts to 1,111,274 tons and beyond that period another 1,525,071 tons of work stands on the industry's books or a potential volume of work ahead of 2,636,345 tons.

Estimated Total Tonnage for the entire industry

CONTRACTS CLOSED	1951	1950	Avg. 1947/1950
January	361,373	147,275	161,976
February	256,746	146,695	152,186
March	297,517	236,111	221,327
April	337,026*	191,183	177,825
May	268,166*	237,476	174,206
June	207,966	333,000	196,725
Totals	1,728,794	1,291,740	1,086,385
SHIPMENTS			
January	214,000	154,732	166,810
February	193,638	149,824	161,178
March	237,087	185,232	191,295
April	234,095*	187,801	192,943
May	234,486*	194,752	198,456
June	257,066	202,379	192,851
Totals	1,370,372	1,074,711	1,103,535
TONNAGE AVAILABLE FOR FABRICATION			
Within next 4 months (To Oct. 31, 1951)	1,111,274	780,771	661,434
After next 4 months (From Nov. 1, 1951)	1,525,071	460,842	863,973

*Revised.

Fabricated steel awards this week included the following:

550 Tons, Chamois, Mo., power house for Central Electric Power cooperative, to Reynolds Mfg. Co.

460 Tons, Terre Haute, Ind., 45 transmission towers for Public Service Co. of Indiana, to American Bridge Co.

340 Tons, Mortòn, Pa., Piasecki Helicopter Co. plant extension, to Belmont Iron Works, Philadelphia.

Fabricated Steel inquiries this week included the following:

810 Tons, Cedar Rapids, Iowa, Lynn County bridge project FN-887. Bids due Aug. 7.

305 Tons, Clay County, Minn., bridge project 6408. Bids due Aug. 16.

276 Tons, through steel truss bridge, Selinsgrove Borough, Synder county, Pa. Bids to Aug. 10. Pennsylvania Department of Highways.

270 Tons, Cook County, Ill., state bridge project 1F-2.

195 Tons, I-beam bridge, East Bradford Twp., Chester county, Pa. Bids to Aug. 10. Pennsylvania Department of Highways.

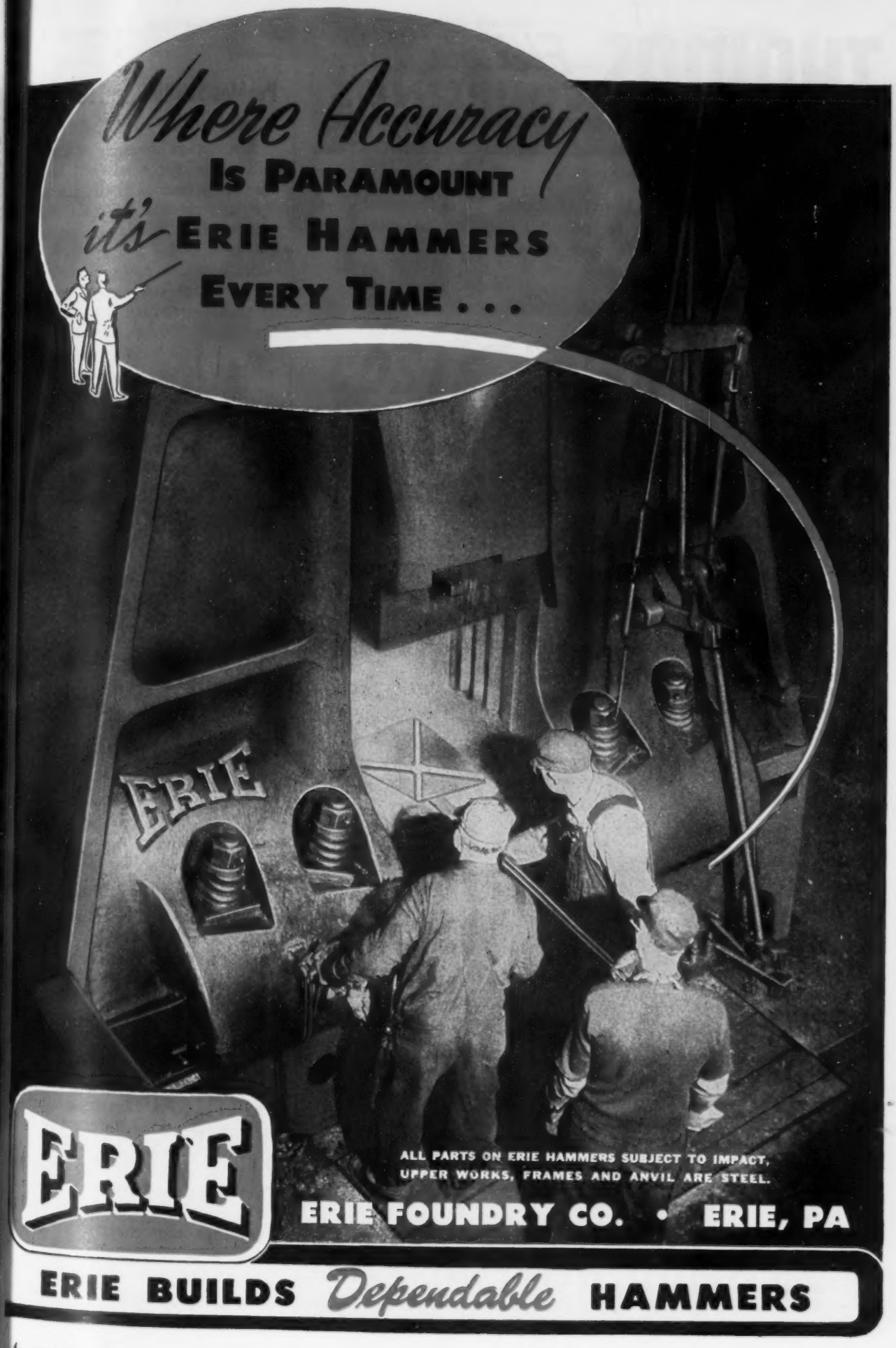
Reinforcing bar awards this week included the following:

550 Tons, Chicago, auxiliary outlet sewers contract 2-A, to U. S. Steel Supply Co., John Dougherty, Contractor.

300 Tons, Terre Haute, Ind., Allis-Chalmers Co., factory building, to Truscon Steel Co., Austin Co., Contractor.

Reinforcing bar inquiries this week included the following:

700 Tons, Chicago, apt. Bldg. 60th and Cottage Grove. Bids due Aug. 7.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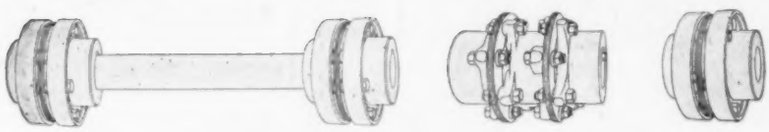

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Pebbles Sub for Steel Balls In Gold Milling—They Save Money

A shortage measure of using a substitute for steel will be retained permanently in the gold milling process of Lake Shore Mines Ltd.'s Kirkland Lake, Ont., plant.

By converting to ore pebbles instead of the customary steel balls in the fine grinding plant an annual saving of $96,400, reported B. C. Crocker, mill superintendent, at a meeting of the Canadian Institute of Mining.

With prices of steel grinding balls popping their lid, supply growing more uncertain, and some ball sizes not available at all, the research staff was ordered to get busy on a hunt for cheap substitutes.

Tests on heavy tungsten carbide grinding balls showed that a ball 68 pct heavier gave 68 pct more capacity. Pebble mills could only be expected to yield 34 pct the capacity of steel mills.

Adjustments were made, plant tests held. Low discharge pebble mills were found to have 40 pct more capacity than high discharge pebble mills. Then the steel mill plant was changed into a pebble mill plant. It was accomplished by expanding the diameter of the mills to a point where they drew the same power and had the same capacity as the original steel ball process.

Mack Develops Rail Car

The cause of transportation unity (between railroads and trucking) has been sweetened a little. Mack Trucks, Inc., points to its development of a single unit diesel railcar for the New Haven Railroad as a "dramatic example of transportation integration."

Engineering departments of both firms have gotten heads together in designing the rail unit. Powerplant is Mack's 220 hp six-cylinder supercharged diesel engine coupled to a 300-volt direct current generator. Propulsion equipment consists of four 55 hp electric motors.

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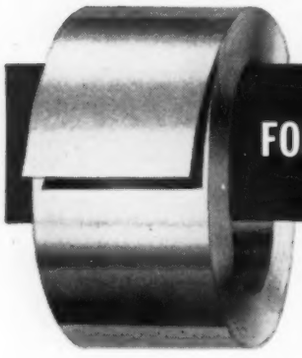

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Fast Tax Write-Offs

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July 13-20
totaling $229,015,498
2793 authorized to date
totaling $8,335,472,305

Latest DPA certificates listed by company, use, amount applied for, amount eligible, and pct approved.

Hamel-Dahl Co., Providence, R. I., automatic valves, $29,802, $29,802, 90.

Connecticut Spring Corp., Hartford, Conn., springs, $9,248, $9,248, 75.

St. Johnsbury & Lamoille County R. R., St. Johnsbury, Vt., transportation-locomotives, $78,065, $78,065, 65.

Marlin Rockwell Corp., Plainville, Conn., bearings, $418,118, $413,118, 75.

Burndy Engineering Co., Inc., Norwalk, Conn., electrical connectors, $547,500, $500,000, 75.

Bliss & Laughlin, Inc., Mansfield, Mass., steel bars, $22,000, $22,000, 60.

Industrial Steels, Inc., Cambridge, Mass., stainless steel sheets & plates, $80,527, $29,933, 60.

Allegheny Ludlum Steel Corp., Watervliet, N. Y., titanium, $135,244, $135,244, 75.

International Nickel Co., Inc., Bayonne, N. J., castings, $64,951, $64,951, 75.

Bendix Aviation Corp., Teterboro, N. J., aircraft instruments, $1,218,058, $1,138,237, 75.

Sacks-Barlow Foundries, Inc., Newark, N. J., iron castings, $442,798, $442,798, 75.

Davis-Larchmont Corp., Larchmont, N. Y., valve parts for hydraulic controls, $23,186, $3,274, 75.

Orange Roller Bearing Co., Inc., Orange, New Jersey, needle bearings, $415,165, $372,833, 85.

Davidson Pipe Co., Inc., Brooklyn, N. Y., warehousing and handling, steel pipe, $475,000, $132,000, 60.

Solar Steel Corp., Union, New Jersey, sheet steel, $96,900, $96,900, 60.

Thomson Industries, Inc., New Hyde Park, N. Y., ball bushings, $209,400, $209,400, 85.

General Motors Corp., Tonawanda, New York, aircraft, $20,844,000, $20,844,000, 75.

Bethlehem Limestone Corp., Hanover, Pa., calcite and dolomite, $282,000, $142,000, 75.

Bearings Co. of America, Lancaster, Pa., ball bearings, $149,216, $149,216, 85.

Arcos Corp., Philadelphia, Pa., electrode welding, $244,300, $219,300, 75.

Allegheny Ludlum Steel Corp., W. Leechburg, Pa., stainless steel strip, $50,648, $50,648, 70.

Standard Lime & Stone Co., Pleasant Gap, Pa., fluxing limestone, $901,254, $901,254, 75.

Youngstown & Northern R. R. Co., Pittsburgh, Pa., transportation services, $1,240,000, $1,240,000, 80.

Penn-Harris Steel Co., Harrisburg, Pa., steel bars, $3,275, $3,275, 60.

Columbia Steel & Shafting Co., Carnegie, Pa., cold-finished bar steel, $1,500,000, $1,500,000, 60.

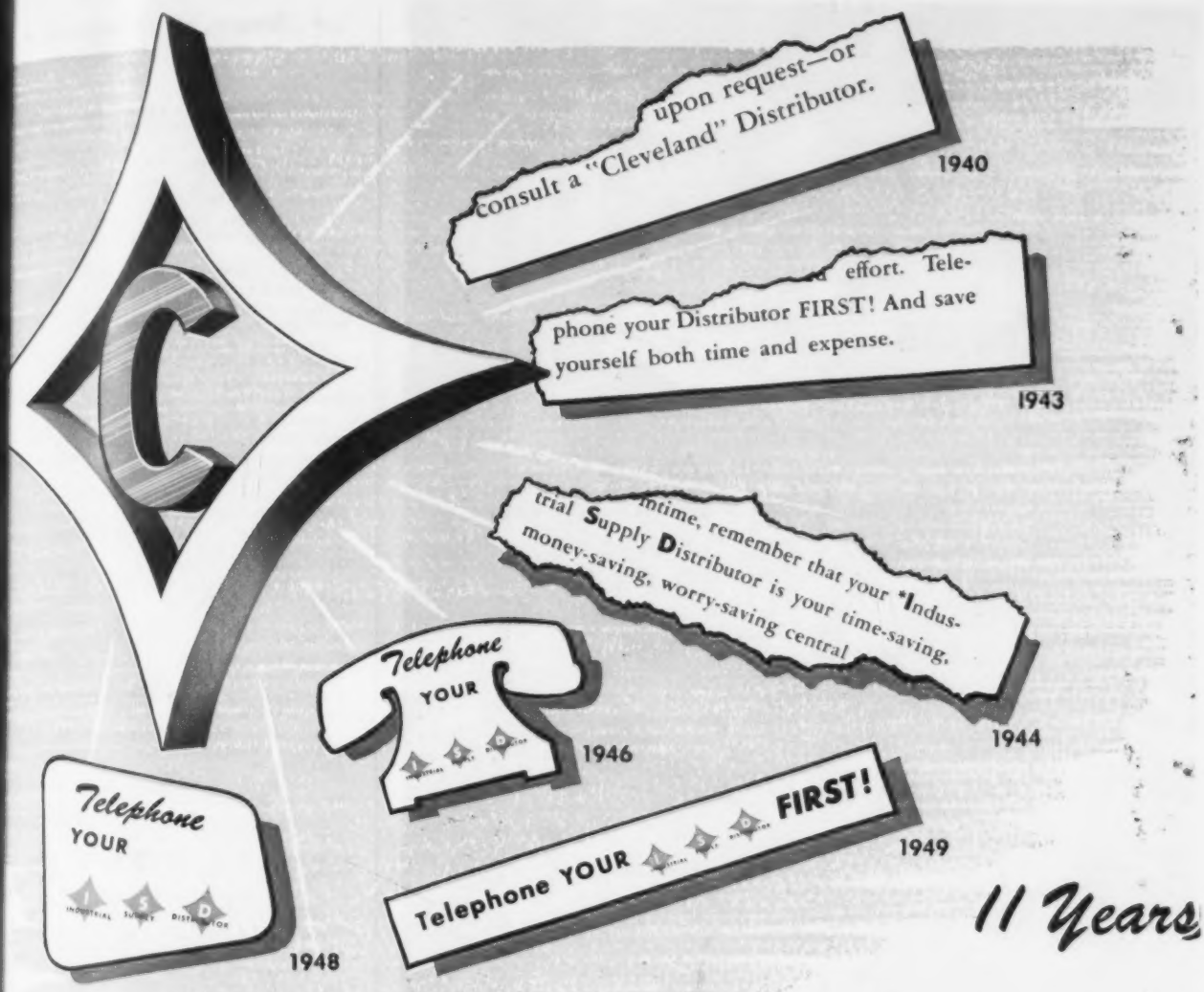
Blaw-Knox Co., Groveton, Pa., anti-aircraft, $770,600, $493,500, 75.

Orefraction, Inc., Pittsburgh, magnetite ore, $73,148, $73,148, 75.

National Forge & Ordnance Co., Irvine, Pa., ordnance, $637,088, $637,088, 80.

Nice Ball Bearing Co., Philadelphia, anti-friction bearings, $1,573,251, $1,573,251, 85.

Universal Ball Co., Willow Grove, Pa., precision balls, $250,000, $244,750, 85.



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For more than ten years we have been reminding you to "Telephone Your Industrial Supply Distributor" for prompt, dependable service on *Cleveland* Twist Drills, Reamers and other tools bearing the famous ◇ trade mark. The arrangement of the words has been changed from time to time, as illustrated above—but the message always has been the same.

Since 1940 we have been making this suggestion month after month in all of our advertising—and it's just as timely today. Whatever tools, equipment or supplies you may require, you will save time and money by calling your Industrial Supply Distributor *first.* Even in the case of hard-to-get items, you'll find that often he is able to speed deliveries. For your Distributor is a favored customer of many factories; he has "first call" on their production.

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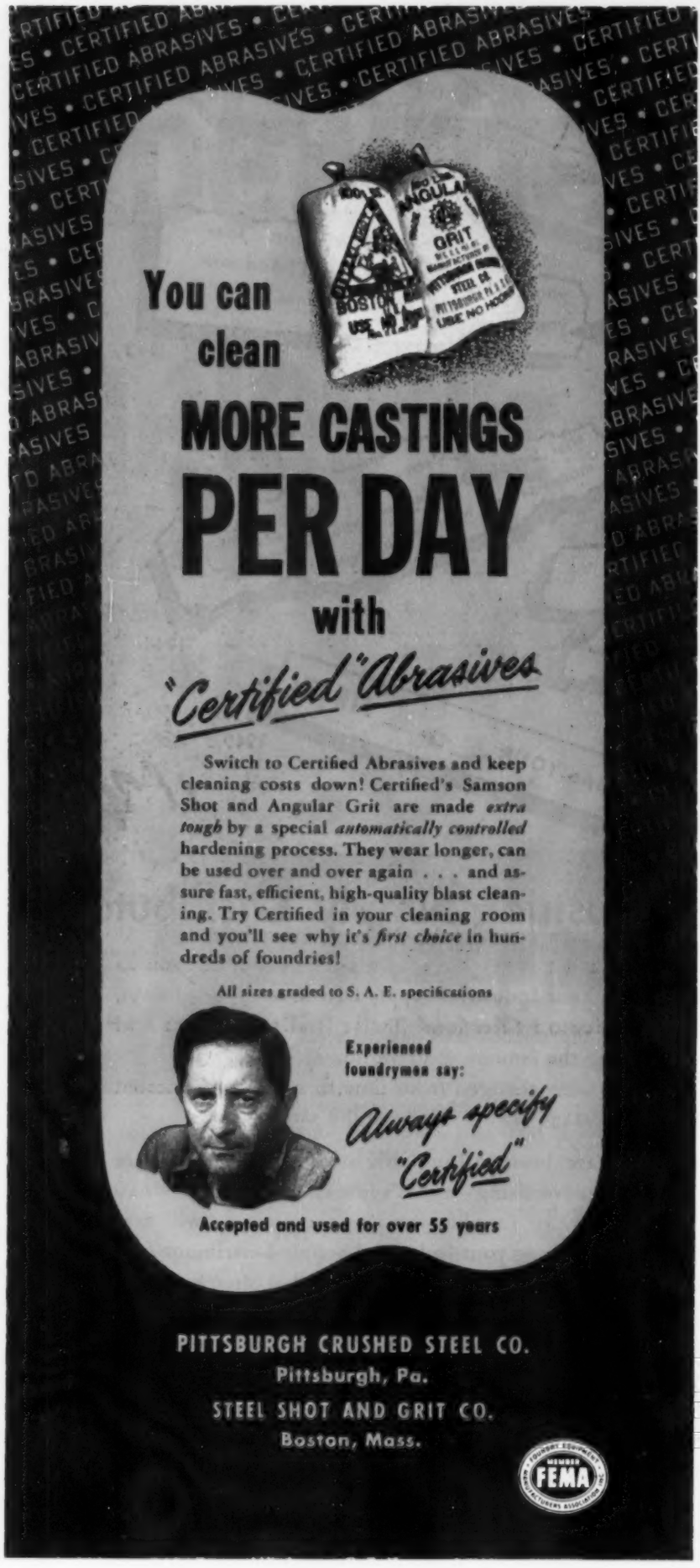

You can clean
MORE CASTINGS PER DAY
with
"Certified" Abrasives
Switch to Certified Abrasives and keep cleaning costs down! Certified's Samson Shot and Angular Grit are made extra tough by a special automatically controlled hardening process. They wear longer, can be used over and over again . . . and assure fast, efficient, high-quality blast cleaning. Try Certified in your cleaning room and you'll see why it's first choice in hundreds of foundries!
All sizes graded to S. A. E. specifications
Experienced foundrymen say:
Always specify "Certified"
Accepted and used for over 55 years
PITTSBURGH CRUSHED STEEL CO.
Pittsburgh, Pa.
STEEL SHOT AND GRIT CO.
Boston, Mass.
MEMBER FEMA

• News of Industry •

Union Railroad Co., Pittsburgh, Pa., transportation services, $3,410,000, $3,410,000, 80.

Palmer Wellock Tool Corp., Meadville, Pa., tank tread forgings, $11,200, $11,200, 90.

A. M. Byers Co., Economy, Pa., steel & wrought iron coils, $2,082,150, $2,082,150, 60.

Pennsylvania Power Co., W. Pittsburgh, transmission electricity, $13,206,500, $13,077,000, 35.

Rockwell Mfg. Co., Tupelo, Miss., drill units, drill presses, saws, $1,345,491, $1,315,491, 80.

Timken Roller Bearing Co., Canton, roller bearings, $114,274, $114,274, 75.

Thompson Products, Inc., Cleveland, aircraft parts, $1,916,861, $1,742,857, 75.

Goodyear Tire & Rubber Co., Akron, wheels for tanks, $228,390, $228,390, 80.

Timken Roller Bearing Co., Bucyrus, Ohio, roller bearings, $3,813,273, $3,768,273, 75.

Jennings Mfg. Co., Masury, Ohio, tanks, pipe, $129,278, $125,582, 60.

Kelly Island Lime & Transport Co., Marblehead, Ohio, limestone, $85,102, $85,102, 75.

Commercial Shearing & Stamping Co., Youngstown, Ohio, "Bailey" panel bridges, $157,409, $102,494, 60.

Grabler Mfg. Co., Cleveland, malleable iron, $873,582, $873,582, 60.

Monroe Auto Equipment Co., Monroe, Mich., ordnance, $48,858, $48,858, 85.

Dow Chemical Co., Midland, Mich., chlorine, $9,905,000, $9,905,000, 50.

Surface Combustion Corp., Columbus, Ohio, engine heater, $46,840, $10,960, 75.

Detroit & Toledo Shore Line R. R. Co., Detroit, Mich., railroad services, $681,000, $681,000, 80.

Ford Motor Co., Livenia, Mich., tanks, $22,753,603, $22,099,642, 75.

Lafayette Steel Co., Detroit, plate & strip steel, $479,798, $465,865, 60.

Republic Steel Corp., Cleveland, steel bars, $100,000, $100,000, 60.

Fanner Mfg. Co., Cleveland, malleable iron castings, $1,043,250, $963,250, 75.

Babcock & Wilcox Co., Barberton, Ohio, steam boilers, $2,297,861, $2,103,184, 60.

Chrysler Corp., Warren Twp., Mich., military trucks, $223,513, $223,513, 75.

McNeil Machine & Engr. Co., Akron, tire curing presses, $1,097,972, $1,044,972, 75.

Monroe Auto Equipment Co., Monroe, Mich., ordnance, $22,099, $16,122, 75.

Detroit, Toledo Ironton R. R. Co., Dearborn, Mich., railroad freight, $4,081,798, $3,336,798, 80, $745,000, 65.

Pioneer-Toledo Corp., Toledo, aircraft parts, $90,000, $90,000, 90.

Solar Steel Corp., River Rouge, Mich., steel products, $1,093,000, $1,093,000, 60.

Kaydon Engineering Corp., Muskegon, Mich., bearings, $287,000, $287,000, 85.

Timken Roller Bearing Co., Canton, roller bearings, $756,681, $756,681, 75.

Timken Roller Bearing Co., Columbus, Ohio, roller bearings, $569,585, $569,585, 75.

Timken Roller Bearing Co., Zanesville, Ohio, roller bearings, $29,718, $29,718, 75.

Timken Roller Bearing Co., Zoarville, Ohio, roller bearings, $52,732, $52,732, 75.

General Motors Corp., Livonia, Mich., transmissions assemblies, $15,322,556, $15,322,556, 75.

General Motors Corp., Flint, Mich., aircraft parts, $15,246,000, $15,246,000, 75.

Defense Project, Inc., Maple Grove, Ohio, dead burned dolomite, $3,500,000, $3,500,000, 75.

Illinois Central R. R. Co., Chicago, railroad freight, $4,950,000, $4,950,000, 80.

Illinois Central R. R. Co., Chicago, railroad freight, $5,202,500, $5,202,500, 80.

Chicago, Indianapolis & Louisville R. R. Co., Chicago, Ill., rail transportation, $655,000, $655,000, 80.

Wilson Steel & Wire Co., Chicago, steel wire, $15,542, $15,542, 60.

Bell & Howell Co., Lincolnwood, Ill., sniperscope, tank periscope, $1,294,722, $1,294,722, 75.

Torrington Co., Inc. of Ind., South Bend, Ind., anti-friction bearings, $1,492,819, $1,477,172, 75.

Bliss & Laughlin, Inc., Harvey, Ill., steel bars, $64,500, $64,500, 60.

Chicago, Indianapolis & Louisville R. R. Co., Chicago, rail transportation, $280,000, $280,000, 80.

Indianapolis Machinery & Supply Co., Inc., Indianapolis, rebuilding machine tools, $313,965, $136,465, 80.

Craft Mfg. Co., Chicago, storage and repair kits, $151,930, $151,930, 50.

Oak Mfg. Co., Crystal Lake, Ill., switches & tuners for communications, $426,047, $408,673, 80.

Weatherhead Co., Syracuse, Ind., pipe fittings, $760,899, $750,699, 60.

Link-Belt Co., Indianapolis, ball bearings, $648,230, $648,230, 75.

American Gage & Machine Co., Aurora, Ill., voltmeters, $15,821, $14,589, 75.

Great Northern Railway Co., St. Paul, rail transportation, $5,900,000, $5,900,000, 80.

Joy Mfg. Co., St. Louis, electrical connector, $1,510,000, $1,250,000, 75.

Cessna Aircraft Co., Hutchinson, Kansas, aircraft assemblies, $106,139, $106,139, 75.

Missouri Pacific R. R. Co., St. Louis, locomotives, $24,655,591, $24,655,591, 65.

American Smelting & Refining Co., Omaha, refined lead & unrefined zinc, $120,000, $108,250, 60.

Gideon-Anderson Lumber Co., Gideon, Mo., ordnance, $17,249, $10,602, 50.

Warren Petroleum Corp., Antioch, Okla., hydrocarbons & gas, $1,214,684, $1,214,684, 60.

Mid-Continent Petroleum Corp., Tulsa, Okla., petroleum alkylate, $817,274, $817,274, 100.

Dow Chemical Co., Freeport, Tex., ammonia, $4,316,800, $4,316,800, 50.

U. S. Lima Products Corp., Henderson, Nev., high calcium quicklime, $189,519, $189,519, 75.

Davison Chemical Corp., unknown, petroleum cracking catalyst, $5,459,750, $4,301,512, 85, $858,238, 50.

Wm. R. Whittaker Co., Ltd., Van Nuys, Calif., aircraft-fuel & hyd. valves, $2,534,250, $2,427,250, 80.

E. & J. Heat Treating & Sandblasting Co., Los Angeles, heat treating of metal, $90,000, $60,000, 75.

Midwest Rubber Reclaiming Co., Los Angeles Area, reclaimed rubber, $2,000,000, $1,547,000, 70.

Kirkhill Rubber Co., Bres, Calif., mixing rubber and rubber compounds, $182,889, $182,889, 60.

Northrop Aircraft, Inc., Hawthorne, Calif., airplane parts, $92,395, $76,071, 75.

Boeing Airplane Co., Seattle, aircraft spare parts, $795,985, $795,985, 75.

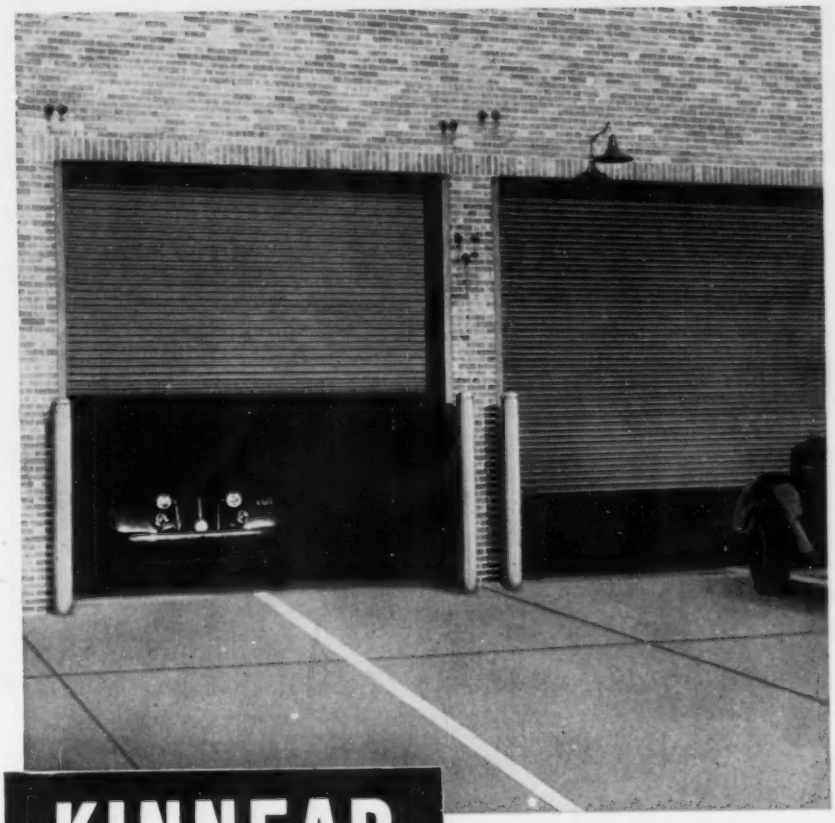
Atlas Foundry & Machine Co., Tacoma, Wash., steel castings, $621,048, $428,000, 75.

All Nations Except Canada

Canada becomes the exception which proves the rule. It is now the one country which will not be barred from U. S. economic aid because it trades with Russia or the Red bloc.

Such aid has been prohibited by congressional action. But under the Kem amendment, the National Security Council was given limited leeway in waiving the ban. The council points out, in applying the waiver, that no aid has been extended to the Canadian government, only to private industry there.

OPEN WIDE



KINNEAR Rolling Doors

Clear The Entire Opening

You get full use of all doorway space when you equip openings with Kinnear Rolling Doors. They clear the doorway completely—from jamb to jamb and from floor to lintel. Even the floor, wall and ceiling space *around* the doorway remains clear and usable at all times.

The doors rise straight upward, coiling above the lintel. Trucks, material, or equipment can be left within inches of the door curtain, both inside and outside the entrance, without blocking door action in any way.

The rugged all-steel construction of Kinnear Rolling Doors assures an extra measure of protection against theft, intrusion, storm damage, and fire. Kinnear Rolling Doors are built any size, with manual, mechanical or motor operation. Write for complete information.

The KINNEAR Manufacturing Co.

1760-80 Fields Avenue, Columbus 16, Ohio — 1742 Yosemite Avenue, San Francisco 24, Calif.

Offices and Agents in All Principal Cities

SAVING WAYS IN DOORWAYS — KINNEAR ROLLING DOORS

Holcroft furnace for carbo-nitriding bulk-loaded automotive parts. Has automatic quench and draw.

CARBO-NITRIDING

A Superior Case-Hardening Process

Developed by HOLCROFT

CARBO-NITRIDING provides a "gas cyanided" case by heating the work in a controlled atmosphere composed of generator gas, hydrocarbon gas and ammonia. This Holcroft process uses continuous-type furnaces such as the unit shown above, and offers these advantages:

1 Low operating cost—often as low as one-fourth that of liquid cyaniding.

2 Superior wear resistance—greater than with carburizing.

3 Greater depth of hardenable case obtained per unit of time than by carburizing at the same temperature.

4 Minimum distortion through low-temperature operation and slow cooling when required.

5 Applicable to both plain carbon and alloy steels.

Although the theory behind carbo-nitriding is mentioned in a patent issued in 1883, it was not applied to high-production furnaces until rediscovered independently by Holcroft & Company in 1936. The first furnaces of this type, built 15 years ago, are still in operation; many other production furnaces installed since then have further proven the merits of this process.

You, too, can take advantage of this metallurgical leadership. Write today for complete information.

BLAZING THE HEAT TREAT TRAIL

SINCE 1916 Holcroft AND COMPANY

BUILT BY HOLCROFT & COMPANY DETROIT-MICH

PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

6545 EPWORTH BLVD. DETROIT 10, MICHIGAN

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HOUSTON 1 R. E. McArdle 5724 Navigation Blvd.

CANADA Walker Metal Products, Ltd. Windsor, Ontario

EUROPE S. O. F. I. M. Paris 8, France

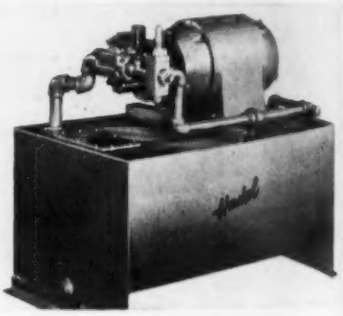
new equipment

Continued from Page 38

Diamond tool service

A new diamond tool service is being offered, guaranteeing dressing tools unconditionally against loosening of the diamonds from their setting for the lifetime of the tool. In addition to the conservation of industrial diamonds, glazing or loading of the grinding wheel is said to be prevented by the powdered metal mounting. Single point and multi-diamond tools are available including hand tools and diamond impregnated dressing tools. Dressing tool users are asked to provide a detailed description of their operation so that diamonds can be selected to give the best performance in service. Worn tools must be returned to Nesen by the buyer for resetting under the terms of the guarantee. *Nesen Diamond Tool Corp.*

For more data insert No. 13 on postcard, p. 35



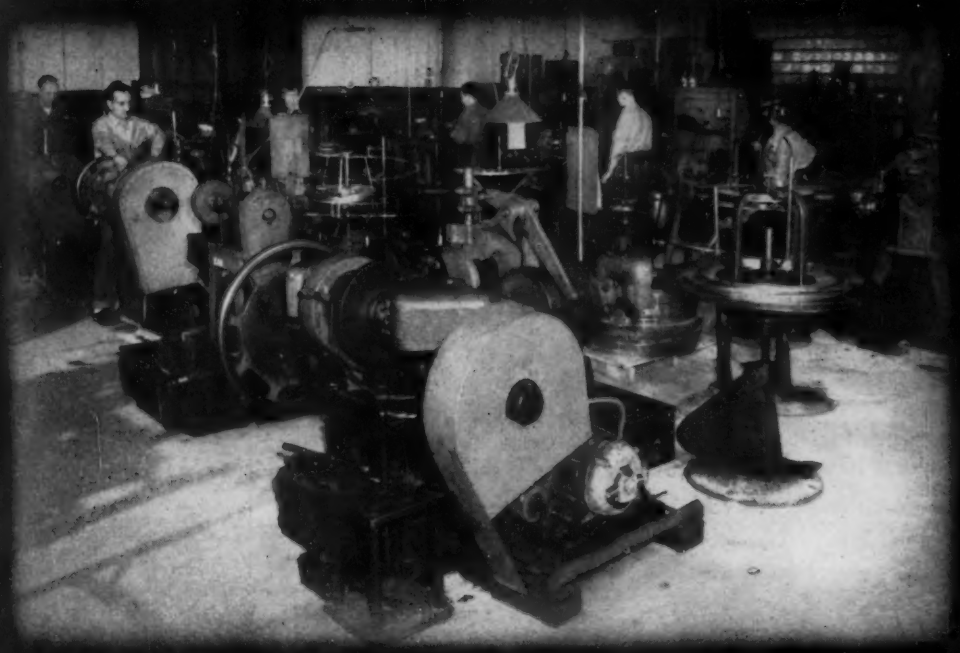
Hydraulic power units

New hydraulic power units combine reservoir, pump and motor into a compact, practical, efficient unit. The line contains 224 standard models manufactured in three basic standard series: low-pressure units supply to 1750 psi pressure and range from 1½ to 50 gpm in single, 100 gpm in double pump models; Hi-Low units provide a dual pressure source by combining a high pressure and low pressure pump with automatic unloading of the low pressure pump; Hi-pressure units supply to 10,000 psi pressure, range from 1½ to 5 gpm in single and 10 gpm in double pump models. *Haskel Engineering & Supply Co.*

For more data insert No. 14 on postcard, p. 35

Automatic machines...

another of Accurate's facilities



These four slides are typical of the modern cost-cutting equipment in use at Accurate.

. . . that lowers

the overall cost of your springs

IN the battle for lower costs, the machines of your suppliers can play a vital part. Good examples are the machines illustrated above—these four slides automatically produce intricate wire forms in an almost endless variety of shapes . . . and they do it more accurately and at a fraction of the cost of previous methods.

Machines such as these are typical of the many modern technological advancements in use at Accurate to make better springs at lower cost to our customers. And behind the machines are skilled springmakers and practical, experienced engineers who have slashed spring costs for many spring users and who would welcome the opportunity to do the same for you. The next time you need springs, be sure to find out what Accurate can do for you.

ACCURATE SPRING MFG. CO.
3819 W. Lake Street
Chicago 24, Illinois

WRITE TODAY for your copy of the new revised Accurate Handbook of Technical Data on Springs. It's full of short cuts for making spring calculations.

Be sure the springs you buy are Accurate

Accurate Springs

Springs
Wire Forms
Stampings

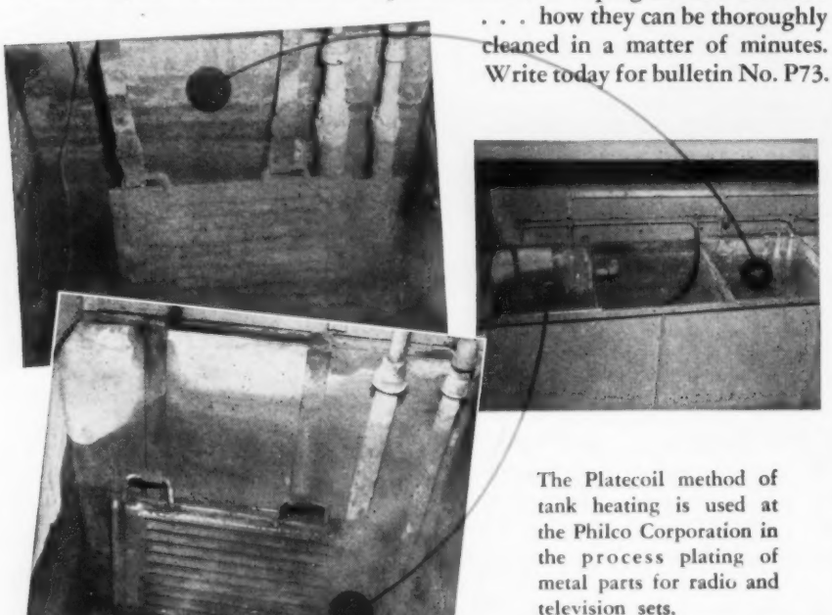
PHILCO finds

"platecoils have better heat conductivity than any similar coil"

The Platecoil method of tank heating is being used by the Philco Corporation of Philadelphia in the process plating of metal parts for radio and television sets. Although the Platecoils haven't been used very long, Philco production officials say they are "most pleased with the results that have been thus far obtained." They've found that, at least in their operation, the Platecoils are self cleaning . . . which saves many hours of maintenance time. They've found, too, that Platecoils have a much higher rate of heat conductivity . . . which means faster tank heating.

Platecoils have a greater BTU transfer because they have more prime surface in a given area. A 22"x47" Platecoil gives the same heat transfer surface as 32 ft. of 1½" pipe. Thus Platecoil saves about 50% over equivalent pipe coil. Think what this means to you in lower initial cost, lower installation and handling costs.

Learn too, how Platecoils can be replaced without dumping the tank solution . . . how they can be thoroughly cleaned in a matter of minutes. Write today for bulletin No. P73.



The Platecoil method of tank heating is used at the Philco Corporation in the process plating of metal parts for radio and television sets.

PLATECOIL gives you these ADVANTAGES

- Cleaned and Repaired Without Dumping Tank Solution
- Greater BTU Transfer Per Unit Area
- Weighs Only Half as Much as Pipe Coil
- No Threaded Joints in Tank
- Increased Tank Capacity
- Fast, Easy Installation
- Easy to Clean

PLATECOIL
Division
KOLD-HOLD MFG. CO.
LANSING 4, MICHIGAN

new equipment

Continued

Lightweight welder

A new Shop-King welder features 6 heat stages, has 20 to 100 amp output, welds metals 24 gage to 3/16 in. thick, and handles rods 1/16 to ⅛ in. This portable welder is suitable for light production, fast maintenance and repair welding. *Precision Welders Mfg. Co.*

For more data insert No. 15 on postcard, p. 35

Reamers to cut tool costs

Reamers made on order to job specifications combine new design and manufacturing methods. Tolerances are held to 0.002 to −0.000 in. or closer. Reamers are ground and honed to give sharp cutting edges and to minimize sticking of the metal to the cutting edge. Tool sizes range from 0.0005 to ¼ in. diam, in flat, half-round and fluted types. *Woodruff & Stokes Co., Inc.*

For more data insert No. 16 on postcard, p. 35

Adjustable door fastener

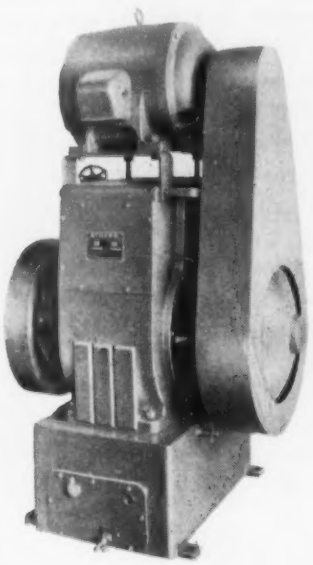
Speed of installation, ability to compress a gasket, and adaptability to almost any door and frame thickness are features of an adjustable pawl fastener for use on industrial machinery and commercial vehicles. Installed by drilling only 3 holes and applying two rivets, this all-metal fastener fits through the door panel, is delivered as a single unit that requires no further assembly. Fasteners are supplied with protruding knob for hand operation or with flush screwdriver operated head. *South Chester Corp.*

For more data insert No. 17 on postcard, p. 35

Pneumatic vibrators

Outstanding feature of new pneumatic vibrators is a special corrosion-proof bronze alloy cylinder liner that assures thorough and permanent piston lubrication, full-power starting, high-speed operation and maximum service life. Operating on standard 80 psi air line pressure, Series 77 vibrators deliver from 2200 to 600 impacts per min, depending upon piston diameter. Speed of vibration can be regulated by varying line pressure. Having facilities for single or double-end mounting, these units permit vibration in line with direction of material flow or at a 90° angle to it. Nut and bolt mounting permits rapid attachment. *Spo, Inc.*

For more data insert No. 18 on postcard, p. 35



Self-contained pump

A new Stokes Microvac pump has a capacity of 500 cfm and is suitable for any type of vacuum processing work. It is a water-cooled unit that operates at 390 rpm with a top-mounted 25 hp motor. It operates at a high volumetric efficiency due to the complete discharge of air at each stroke, with no chance for re-expansion. With only four moving parts and low relative surface motion of piston to housing, minimum wear and low up-keep can be expected. *F. J. Stokes Co.*

For more data insert No. 19 on postcard, p. 35

REMOVE / SCALE OXIDES FLUX

new-improved

Faster, easier with WYANDOTTE A.E.

WYANDOTTE A.E. IS A PICKLING AGENT that, in general, can effectively and advantageously replace hydrochloric and sulfuric acids. Because it's a mixture of powdered acid salts, the new, improved A.E. is easy to control. And the difference in results? A.E. contains synthetic wetting agents that "wet out" and rinse fast, leaving surfaces clean and really bright!

Ask your Wyandotte Representative to show you how easy the new A.E. is to use, how it does a much better job for you.

P.S. If you have a cleaning problem of any sort, write Wyandotte for free technical help.

Wyandotte A.E. is a pickling agent that's balanced to give a wide range of applications. Users report superior results of A.E. over previous methods in the following applications:

On zinc base die castings following electrocleaning and prior to plating

On brass following electrocleaning and prior to plating

For removing heat treat scale from ferrous parts in tumble barrels

For removing heavy tarnish from brass

For removing dirt, scale, oxide from automobile radiators

For removing scale and rust from steel after electrocleaning and prior to electroplating

For removing rust and spot weld marks from parts in tumble barrel applications, prior to barrel plating

For removing flux after brazing operations

NEW

WYANDOTTE A.E.

Wets out and rinses fast
Gives a bright finish
Is very easy to handle—not dusty
Eliminates water or acid spotting
Does not give off obnoxious fumes
Has long solution life
Less critical to control

"Cleaning the World"

THE WYANDOTTE LINE—products for burnishing and burring, vat, electro, steam gun, washing machine and emulsion cleaning, paint stripping, acid pickling, related surface treatments and spray booth compounds. An all-purpose floor absorbent: Zorball. In fact, specialized products for every cleaning need.

WYANDOTTE CHEMICALS CORPORATION
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Service Representatives in 88 Cities

Wyandotte
REG. U. S. PAT. OFF.

45% gain in Electro malleable iron

HIGH SPEED

grinding

Electro SINCE 1919

HIGH SPEED
WHEELS FOR
SNAGGING
CUTTING-OFF
TOOL ROOM
AND
CYLINDRICAL
GRINDING
for Swing Frame, Floor Stand, Bench Stand and Portable Grinding Machines

•

GRINDING WHEEL MANUAL 645 and Speed Calculator FREE ON REQUEST

In actual production tests under identical conditions, Electro HIGH SPEED GRINDING WHEELS removed 153 lbs. of metal while competitive wheels averaged only 105 lbs. In grinding from 24" to 20" diameter, Electro removed 6.8 lbs. of metal per cubic inch of wheel and 10.4 lbs. per hour. • This greater efficiency in Electro wheels when grinding annealed malleable castings will hold comparably with Electro Cutting-Off and all other wheels. • All we ask is opportunity to prove it in your plant, on your work and without obligation. Write, phone or wire.

ELECTRO REFRACTORIES & ABRASIVES CORPORATION

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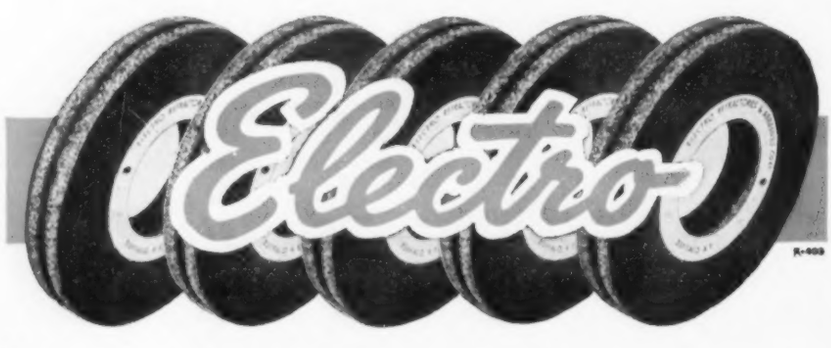
WEST COAST WAREHOUSE, LOS ANGELES 58, CAL.
ELECTRIC FURNACE PLANT, P. Q., CANADA



new equipment

Continued

Industrial cleaner

Operating from a compressed air source, a new industrial cleaner has vibrating air valve that creates by the jet principle an agitating suction that forces dirt and metal particles into a container. The dirt container is supported on the operator's back by a belt and harness assembly. By operating a second of two finger-tip control valves a vibrating external air jet is created and directed forward through an opening in the cleaner head to dislodge dirt and metal particles from inaccessible places to spots where they can be picked up by instantly changing to a suction action. *Vibro-Pneumatic Cleaner Co., Div. Patterson Products.*

For more data insert No. 20 on postcard, p. 35

Countershaft drive

A new countershaft drive which comes as a package unit, provides wide speed variations for a variety of applications. It is designed for installations where driven shaft speeds must be lower than motor shaft speeds. This low cost unit utilizes 7 and 8-in. combination sheaves and is available for drives from 2 to 15 hp. The assembly consists of a sealed ball-bearing countershaft stand, secured by rigid slide rods to an adjustable motor support for all motor sizes up to NEMA No. 326. The whole assembly may be used or parts may be combined into other types of drives. *Speed Selector, Inc.*

For more data insert No. 21 on postcard, p. 35

Keg handling simplified

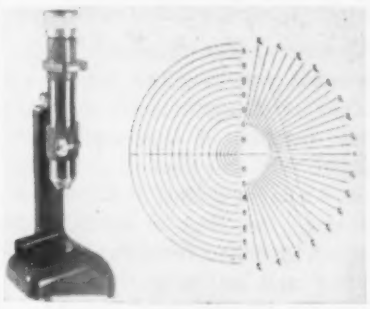
Transportation and storage of hard-to-handle kegs is simplified by a new keg pallet and cover, designed for use with fork lift trucks. The pallet will accommodate six standard kegs on its 42x28 in. deck. The entire pallet is made of heavy gage steel, and is welded throughout. *Phillips Mine & Mill Supply Co.*

For more data insert No. 22 on postcard, p. 35

High speed counter

A patented counter, incorporating high-speed Geneva transfer, meets requirements for higher speeds, and for larger figures—more than ¼ in. high—to provide easier readability. The counter is rated at 1500 drive-shaft rpm that gives 15,000 counts per min with a standard 10-digit unit wheel. Counter is the non-reset type, adding when the drive shaft is rotated in one direction, and subtracting when rotated in opposite direction. It can be made in any figure-capacity, with special unit-wheels. *Veeder-Root, Inc.*

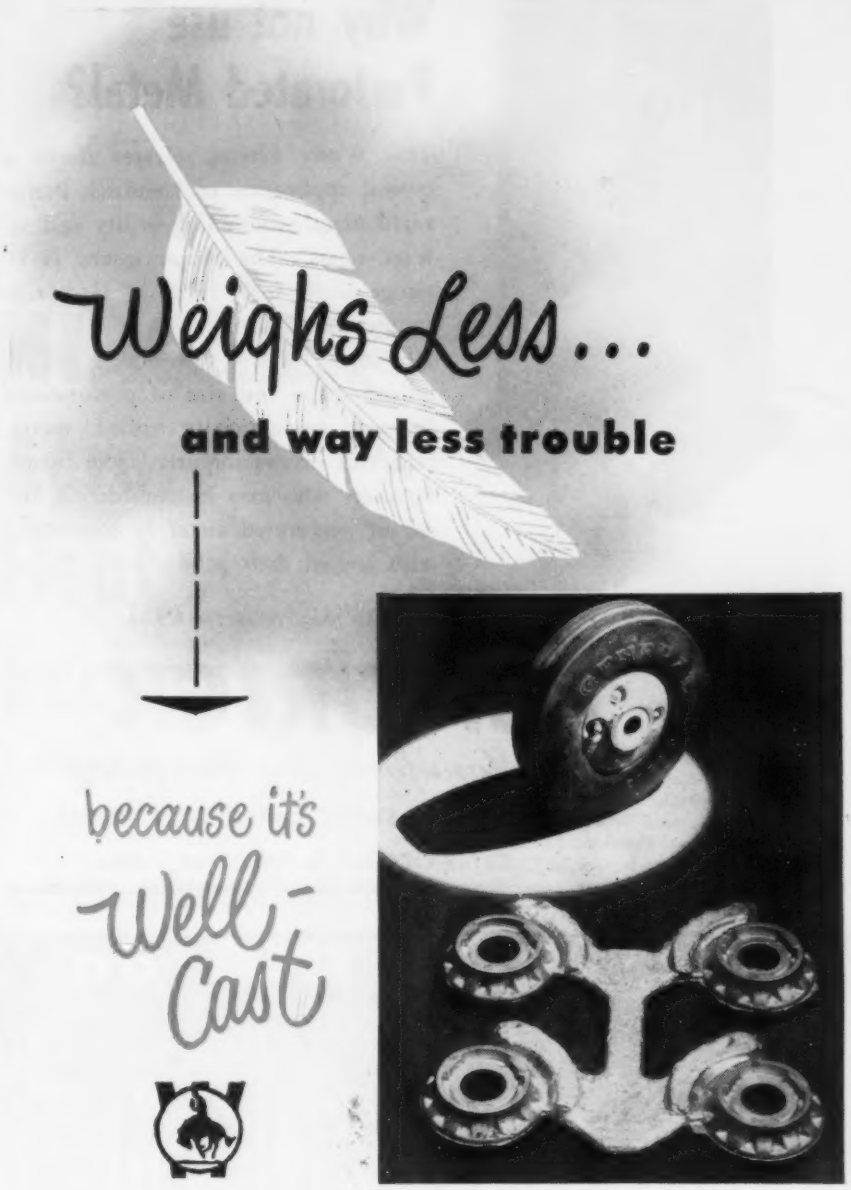
For more data insert No. 23 on postcard, p. 35



Cutter grinder microscope

The P.G. cutter grinder microscope for checking radii, forms and angles of engraving tools, small twist drills and similar tools and components which carry an irregular shape at the end of a cylindrical shank consists of a 15X magnifying microscope with detachable reticle. The adjustable microscope tube is mounted on a verticle slide for focusing the workpiece. A simple V shaped work rest supports the cutters, tools or components of varying sizes. Special reticles can be made to individual requirements. Eyepiece and objectives are interchangeable to vary the total magnification. *J. Arthur Deaking & Son.*

For more data insert No. 24 on postcard, p. 35



This Well-Cast magnesium permanent mold wheel casting—a ¼ lb. light weight—reduces the overall weight of the hand truck on which it's used. Tough as an American in Korea, it's also a push-over to machine. Same thing applies to our sand castings in either magnesium or aluminum. Want to lose some weight?

40 Years' Experience

Well-made wood and metal patterns • If you would like to get the Wellman magazine each month, drop us a note on your business letterhead.

THE WELLMAN BRONZE & ALUMINUM CO.

2511 EAST 93rd STREET • CLEVELAND 4, OHIO

Why not use Perforated Metal?

This Wesix Electric Heater shows a typical application of Hendrick Perforated Metal, combining utility and attractiveness. The heater guard is 20 gauge steel, with 3/16" x 1½" side stagger perforations.

With facilities for producing any required shape and size of perforations in any commercially rolled metal, Hendrick invites inquiries from manufacturers who may be considering the use of perforated metal in connection with any of their products.

1876—Seventy-Fifth Anniversary—1951

SEE OUR CATALOG IN SWEET'S

HENDRICK

Manufacturing Company

Perforated Metals
Perforated Metal Screens
Wedge-Slot Screens
Architectural Grilles
Mitco Open Steel Flooring,
Shur-Site Treads, Armorgrids

37 DUNDAFF STREET, CARBONDALE, PENNA.

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ERIE BOLTING on

DIESEL ENGINES

For over 30 years ERIE has manufactured bolts and studs to the specifications of Diesel Engine builders. This specialized experience gained in working with leading Diesel designing engineers assures you of getting the exact materials and the precise tolerance in bolting desired for your Diesel. Send us your specifications for Diesel Connecting Rod Bolts, Cylinder Head Studs, and other special bolting. Write for new price and data book.

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REPRESENTATION IN PRINCIPAL CITIES

new equipment

Continued

Hydraulic puller

A special sleeve pulling and installing set will handle cylinder liners on more than 200 different makes and models of trucks, tractors and power units. With this new set sleeve jobs that once took hours are claimed to be completed in minutes. The Power-Twin sleeve puller is adjustable to center perfectly over the bore and to provide clearance over cylinder head studs. It removes and installs sleeves from 3 to 6 in. without damage or distortion. *Owatonna Tool Co.*

For more data insert No. 25 on postcard, p. 35

Telescopic roller conveyer

A new roller conveyer, recommended for handling bundles and other objects not having a rigid, flat bottom, is telescopic, easily pulled out and pushed in to follow the load for quick pickup and delivery. Mounted on heavy casters, it can be rolled from one job to another and be instantly ready for action. On shipping platforms, the conveyer goes right into a truck, trailer or freight car. Twelve and 18-in. widths and nine different lengths which extend to 30 ft are available. Wilkie conveyers are all-steel and rugged. When extended, sections pull up even. *Wilkie Co.*

For more data insert No. 26 on postcard, p. 35

Masonry water repellent

One application of a new silicone base water repellent is claimed to keep water out of masonry for periods up to 5 years. The product repels soot and dirt, minimizes efflorescence and reduces spalling. Coverage is estimated to range from 100 to 300 sq ft per gal. *Chem Industrial Co.*

For more data insert No. 27 on postcard, p. 35

Resume Your Reading on Page 39

publications

Continued from Page 35

Creep stress data

Technical information of value to engineers and designers associated with equipment operating at elevated temperatures and pressures is presented in a new data card. Known as TDC 102, it gives information on creep stress for a number of tubing steels. *The Babcock & Wilcox Tube Co.*

For free copy insert No. 33 on postcard p. 35

Chain drive maintenance

An information-packed 32-p. booklet on the "Installation, Operation, and Maintenance of Chain Drives and Conveyors" shows how to get the most service from sprocket chains. The text is short and many illustrations graphically show correct and incorrect ways of solving chain installation, operation and maintenance problems. *Chain Belt Co.*

For free copy insert No. 34 on postcard p. 35

Flexible shafting

Application of flexible shafting for power transmission is described and illustrated in a new 8-p. booklet. Many hints on correct use and ingenious applications of flexible shaftings are contained. Standard fittings and types of shafting are described. *Elliot Mfg. Co.*

For free copy insert No. 35 on postcard p. 35

Electric oil heaters

Instant starting and automatic controls built into electric oil heaters offer convenience and efficiency in heating of heavy fuel oils. The Hauck line of electric oil heaters accurately raises oil temperature to the point required for good combustion and performance in modern oil burning systems. *Hauck Mfg. Co.*

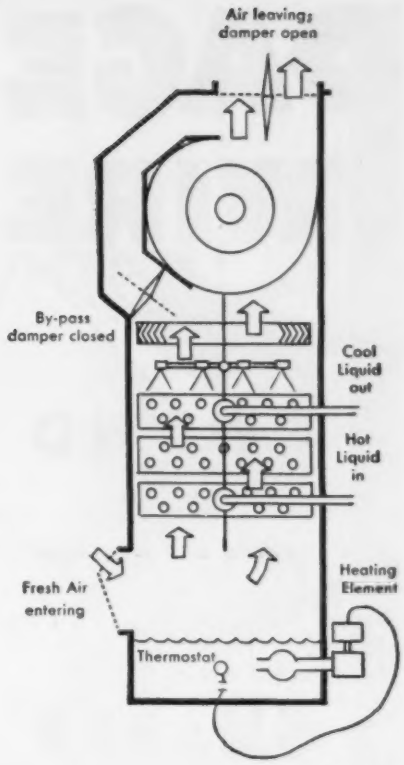
For free copy insert No. 36 on postcard p. 35

Dependable controls

Dependable air and hydraulic controls are described in a 16-p. catalog. Hanna valves are designed and built to function as a balanced team to give top performance in dependable control circuits. De-

Turn to Page 134

NIAGARA Aero Heat Exchanger



U. S. Reissue Patent Nos. 22,533 and 22,553

1. Extends quenching capacity without extra water or cooling tower.
2. Quickly pulls down heat at initial peak load of Quenching.
3. "Balanced Wet Bulb" Control holds quench bath at proper temperature, heating if needed to start after shut-down, and cools or heats by automatic control.
4. Saves cleaning expense as compared to cooling tower which picks up acids and fumes from air.

APPLICATIONS	USED IN THE MANUFACTURE OF OVER 400 PRODUCTS INCLUDING
Quench Oils	Aluminum, copper, steel, nickel and alloys.
Cutting Oils	Diesel, aircraft, automotive and other engines.
Lubricating Oils	Chemical processes, plastics, adhesives.
Cooling water and brine	Gears, bearings, forgings and castings.
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	Ammunition, explosives, shells, ordnance, firearms.
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AMERICAN CHAIN & CABLE

publications

Continued

sign and production engineers will find the technical information in this booklet of value in solving tooling problems. *Hanna Engineering Works.*

For free copy insert No. 37 on postcard p. 35

Painting terne metal roofs

Feature of a new 8-p., four-color booklet on the painting of terne metal roofs is a full-page color chart containing the recommendations of 37 major paint manufacturers for primer and finish coats on terne roofs. A section illustrates how roof and siding can be painted for varying harmonious color effects. *Follansbee Steel Corp.*

For free copy insert No. 38 on postcard p. 35

Turnings crusher

Cost advantages of proper crushing of metal turnings are discussed in a new 8-p. folder. Metal turnings command extra profit per ton and additional economies in recovered cutting oils if properly processed. Capacities, speeds, power, clearance and foundation plans for American rolling ring crushers are described. *American Pulverizer Co.*

For free copy insert No. 39 on postcard p. 35

Air-cooled engines

Dependable, heavy-duty service under the toughest operating conditions and quick, easy starting in any weather may be attained with Wisconsin air-cooled engines described in a new 8-p. bulletin. Specifications, power curves and dimensions for engines of 3 to 30 hp are given. *Wisconsin Motor Corp.*

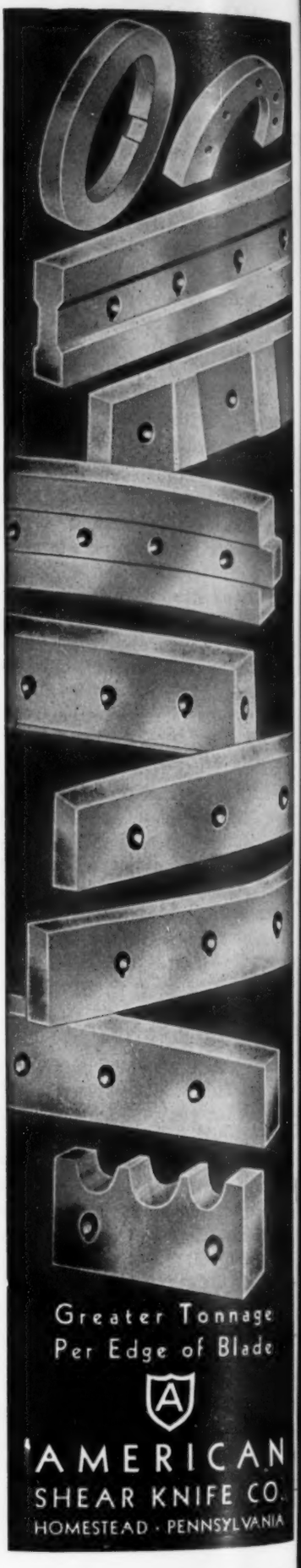
For free copy insert No. 40 on postcard p. 35

Hydraulic power units

A new 12-p. bulletin illustrates hydraulic power units and bell-mounted motorpump units. Some 312 standard models are listed. Performance and application information and recommendations for the selection and installation of hydraulic power units for specific power requirement are listed. *Haskel Engineering & Supply Co.*

For free copy insert No. 41 on postcard, p. 35

Resume Your Reading on Page 36



IRON AGE *markets and prices*

market briefs and bulletins

more iron ore — The Bell Island, Newfoundland, mines of Dominion Wabana Ore Ltd., are being modernized with new equipment being installed. Sharp upswing in production from the current 1,700,000 tons a year to 2,500,000 tons in 1952 will be the result. The $6 million to be spent will eventually put the mine in a position to produce 2,800,000 tons annually. Ore from this largest Canadian producer (until Steep Rock expands and Labrador fields come in) is from submarine workings—some as far as 2½ miles off shore.

forced to substitute — Shortages of steel and tin are forcing manufacturers of containers and packaging materials to use substitutes in order to meet essential demands. Although first-quarter production increased, the gains were absorbed by greater demands. Principal shortages are in nails, wire and dry lumber.

gas drilling —Sharon Steel Corp. has started a gas drilling operation on a farm near its Roemer Works at Farrell, Pa. The company may drill to 3800 ft in a search for possible fuel reserves. The drilling will take about 60 days.

more ovens —A new battery of 87 coke ovens at the Clairton Plant of U. S. Steel Co. is in partial operation. The battery is scheduled for completion within 2 months. Capacity will be 1700 tons of coke per day. By-product gas production will be 15 million cu ft every 24 hours.

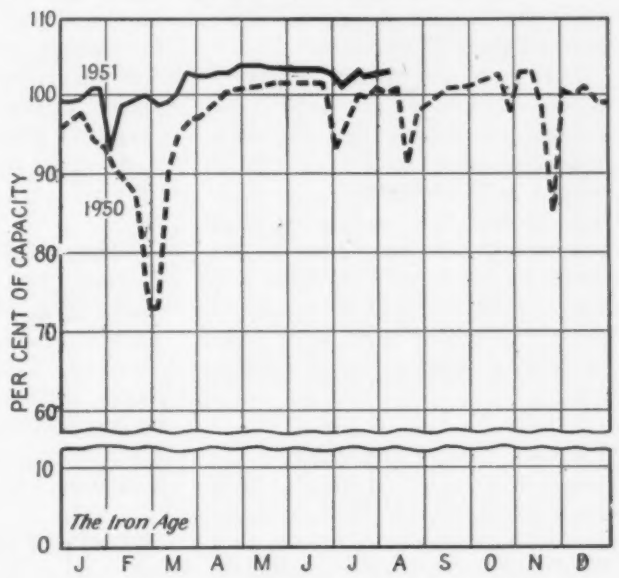
back in blast — Alan Wood Steel Co.'s 500-ton blast furnace was blown in on July 28 and is once again helping to supply eastern foundries. The furnace was out for about 4 weeks for repairs. While this won't cure the pig iron shortage, it will be a help.

Christmas gifts—Wage Stabilization Board says employers may continue to give Christmas and profit-sharing bonuses, even though they may pierce the 10 pct wage increase ceiling. The payments must be made under employers' plans in effect prior to Jan. 25.

wrong yard stick — Several Birmingham industries reported last week that they are receiving enough steel to manufacture items under Controlled Materials Plan. The shortage, they claim, is in brass, bronze and copper. They can't make as many items as authorized and a surplus of steel results. They don't know what yardstick Washington is using to allot materials but they feel it must be the wrong one.

strikes cut production — Strikes in seven plants of four different freight car builders will cut production from 9000 cars in June to nearly 7000 in July. As of July 1 the backlog of orders for all types of freight cars totaled 147,725. The production objective set by government defense agencies is 10,000 cars a month.

Steel Operations †



District Operating Rates—Per Cent of Capacity †

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
July 22	95.0*	104.0*	101.0	101.0	105.0	104.0	96.0	101.0*	100.0*	99.0	93.5	97.0	102.0	101.5
July 29	96.0	104.0	102.0	101.0	105.0	104.0	99.0	103.0	100.0	99.0	101.0	95.5	111.0	102.0

† Beginning Jan. 1, 1951, operations are based on annual capacity of 104,229,650 net tons.
* Revised.

nonferrous metals

outlook and market activities

NONFERROUS METAL PRICES

	July 25	July 26	July 27	July 28	July 30	July 31
Copper, electro, Conn. ...	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered ..	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	$1.06	$1.06	$1.06	....	$1.06	$1.06*
Zinc, East St. Louis	17.50	17.50	17.50	17.50	17.50	17.50
Lead, St. Louis	16.80	16.80	16.80	16.80	16.80	16.80

*Tentative.

Note: Quotations are going prices.

by R.Hatschek

Refiners Get Relief—Smelters of Chilean copper ore and concentrates have been authorized to charge 3¢ per lb more on domestic sales of metal containing imported raw materials. The domestic ceiling remains at 24.5¢ per lb. The rise, permitted by Office of Price Stabilization Supplementary Regulation 46, became effective July 25, just over 2 months after the Chilean producers were granted their 3¢ increase.

The new regulation requires sellers to file reports with OPS stating quantities of raw materials imported and quantities of refined copper sold under the new ceiling. It has been estimated that custom smelters have some 15,000 tons of such copper on hand and they are reported to be selling it rapidly now that they don't have to take a beating on the price set-up.

Order Lead Allocation — National Production Authority last week issued order M-76, placing domestically produced primary lead under complete allocation. This places the top four primary metals — copper, aluminum, zinc and lead—under complete or virtually complete governmental control. Lead for the national stockpile, for users of less than 10 tons a month, or from foreign sources are not included in the control.

Producers of pig lead (other than primary), lead products or alloys need not fill DO rated orders in excess of 25 pct of scheduled production during any one month. Distribution restrictions incorporated in M-38 have been deleted since these functions are taken over by the new order.

Mercury Price Off Further—The persistent softness in demand for mercury has resulted in a further reduction in prices as anticipated. Current price is in the range of $205 to $210 per 76-lb flask, depending mainly on quantity.

Singapore Fluctuates—The Far Eastern tin market has been bouncing up and down in the past week at prices higher than Reconstruction Finance Corp.'s $1.06. Early last week the Singapore market plus transportation to New York was still below the $1.06 and then it zoomed, perhaps expecting RFC to follow. But when the U. S. price remained constant, as it has for over a month, Singapore dipped a bit but still remained higher at press time.

MONTHLY AVERAGE PRICES

The average prices of the major nonferrous metals in July based on quotations appearing in THE IRON AGE, were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	24.50
Lake copper, delivered	24.625
Straits tin, New York	$1.06
Zinc, East St. Louis	17.50
Zinc, New York	18.25
Lead, St. Louis	16.80
Lead, New York	17.00

Copper Shortage Hits Car Output—Poor availability of copper, not the steel shortage, is apparently behind NPA's cutting auto production another 5 pct for the fourth quarter. Two of the causes behind the shortage were the failure of the government to do something about the price situation and foreign copper and the Garfield Smelter strike, which at press time was still in effect.

Price relief has been granted to custom smelters using foreign ore and the Wage Stabilization Board has been brought into the Garfield strike, the first time WSB has had anything to do with a labor dispute. It seems likely that President Truman's action in bringing in WSB will have its effect shortly.

Alcoa Strike May End—Officials of the United Steelworkers of America, Aluminum Co. of America and government mediators sat down together late last week and came to an agreement designed to end the Cleveland forging plant strike. The strike affects about 2100 workers and has lasted since June 11. The union had a meeting of its membership on Monday.

MILL PRODUCTS

(Cents per lb. unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Steel: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

Plate ¼ in. and heavier: 2S, 3S-F, 28.3¢; 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.

Extruded Solid Shapes: Shape factors 1 to 5, 36.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 26, 39.6¢ to $1.16; 36 to 38, 47.2¢ to $1.70.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢ to 33.5¢; cold finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 35¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32 in., 53.5¢ to 42¢; ⅜ to 1½ in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 39.5¢ to 29¢; 52S, 48¢ to 35¢; 56S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 63-S-T-5, OD in in.: 1¼ to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.42; 96 in., $1.522; 120 in., $1.902; 144 in., $2.284. Gage 0.24 x 28 in., 72 in., $1.379; 96 in., $1.839; 120 in., $2.299; 144 in., $2.759. Coiled Sheet: 0.019 in. x 28 in., 28.2¢ per lb; 0.024 in. x 28 in., 26.9¢ lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in., 63¢; 3/16 in. 65¢; ⅛ in. 67¢; B & S Gage 10, 68¢; 12, 72¢; 14, 78¢; 16, 85¢; 18, 93¢; 20, $1.05; 22, $1.27; 24, $1.67. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., ¼ to 0.311 in., 74¢; ½ to ¾ in., 57.5¢; 1¼ to 1.749 in., 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base Up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢ 0.22 to 0.25 lb, 5.9 in., 59.3¢ 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb, ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to $0.219, ⅝ to ¾, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheet and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b.. mill)

	"A" Nickel	Monel
Sheets, cold rolled	77	60½
Strip, cold-rolled	83	63½
Rods and bars	73	58½
Angles, hot-rolled	73	58½
Plates	75	59½
Seamless tubes	106	93½
Shot and blocks	..	53½

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	40.18	....	39.78
Copper, h-r	....	36.03	....
Copper, drawn	....	37.28	....
Low brass	38.47	38.16	....
Yellow brass	37.28	36.97	....
Red brass	38.86	38.55	....
Naval brass	42.27	36.33	37.59
Leaded brass	....	....	35.86
Com'l bronze	40.18	39.87	....
Mang. bronze	45.77	39.80	41.36
Phos. bronze	59.42	59.67	....
Muntz metal	40.28	35.84	37.09
Ni silver, 10 pct	48.26	50.59	....

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	19.00
Aluminum pig	18.00
Antimony, American, Laredo, Tex.	42.00
Beryllium copper, 3.75-4.25% Be	$1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be	$69.00
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.55
Cobalt, 97-99% (per lb)	$2.10 to $2.17
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$200
Lead, St. Louis	16.80
Lead, New York	17.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb	24.50
Magnesium, sticks, 100 to 500 lb	42.00 to 44.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$205-$210
Nickel electro, f.o.b. N.Y. warehouse	59.58
Nickel oxide sinter, at Copper Cliff, Ont., contained nickel	52.75
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	90.16
Tin, New York	$1.06
Titanium, sponge	$5.00
Zinc, East St. Louis	17.50
Zinc, New York	18.25
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	29.00
No. 120	28.50
No. 123	28.00
80-10-10 ingot	
No. 305	35.00
No. 315	32.00
88-10-2 ingot	
No. 210	47.50
No. 215	44.50
No. 245	37.00
Yellow ingot	
No. 405	25.50
Manganese bronze	
No. 421	32.75

Aluminum Ingot

(Cents per lb, 10,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.6
0.60 copper, max.	20.4
Piston alloys (No. 122 type)	21.2
No. 12 alum. (No. 2 grade)	19.5
108 alloy	20.6
195 alloy	20.8
13 alloy	20.8
ASX-679	20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	18.00
Grade 2—92-95%	17.75
Grade 3—90-92%	17.25
Grade 4—85-90%	16.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	39½
Electrodeposited	33⅜
Rolled, oval, straight, delivered	38⅞
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball anodes	25½
Nickel 99 pct plus	
Cast	76.00
Rolled, depolarized	77.00
Cadmium	$2.80
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	97½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl.	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100 oz lots, per oz	67¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21½	20¾
Yellow Brass	19⅛	17⅞
Red brass	20¼	19⅜
Comm. bronze	20½	19¾
Mang. bronze	18¾	18
Brass rod ends	18⅞	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
Refinery brass	17.25*
Radiators	15.50

* Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	19.50
No. 1 comp. turnings	19.25
Rolled brass	15.50
Brass pipe	16.50
Radiators	15.50
Aluminum	
Mixed old cast	9.75
Mixed new clips	11.00
Mixed turnings, dry	9.50
Pots and pans	9.25

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	18¾—19¼
No. 2 heavy copper and wire	17¼—17¾
Light copper	16 —16½
New type shell cuttings	16 —16½
Auto radiators (unsweated)	15 —15½
No. 1 composition	19 —19½
No. 1 composition turnings	18¾—19¼
Unlined red car boxes	17¾—18¼
Cocks and faucets	16¼—16¾
Mixed heavy yellow brass	13½—14
Old rolled brass	15 —15½
Brass pipe	16 —16½
New soft brass clippings	16 —16½
Brass rod ends	17 —18
No. 1 brass rod turnings	16 —17

Aluminum

Alum. pistons and struts	7½— 8
Aluminum crankcases	7½— 8
2S aluminum clippings	10½
Old sheet and utensils	7½— 8
Borings and turnings	5 — 6
Misc. cast aluminum	7½— 8
Dural clips (24S)	10 —11

Zinc

New zinc clippings	12¼—12½
Old zinc	9 — 9¼
Zinc routings	5¾— 6
Old die cast scrap	5¾— 6

Nickel and Monel

Pure nickel clippings	35 —36
Clean nickel turnings	35 —36
Nickel anodes	35 —36
Nickel rod ends	35 —36
New Monel clippings	28 —29
Clean Monel turnings	20 —21
Old sheet Monel	28 —29
Nickel silver clippings, mixed	13 —14
Nickel silver turnings, mixed	12 —13

Lead

Soft scrap, lead	14 —14½
Battery plates (dry)	9½—10

Magnesium

Segregated solids	15 —16
Castings	14 —15

Miscellaneous

Block tin	85 —90
No. 1 pewter	60 —65
No. 1 auto babbitt	48 —50
Mixed common babbitt	16¼—16½
Solder joints	23 —24
Siphon tops	48 —50
Small foundry type	20½—21
Monotype	18¼—18½
Lino. and stereotype	17½—18
Electrotype	15 —15½
Hand picked type shells	8¾— 9
Lino. and stereo. dross	8¾— 9
Electro. dross	5 — 5¼

SCRAP *iron and steel*

markets
prices
trends

Scrap mission to leave for Korea . . .

War scrap needs gentle touch . . .

U. S. figures on inventories listed.

Dealers in iron and steel scrap were asked by the government to bid on 40,000 tons of Navy-owned scrap which must be salvaged from Alaska and the Aleutian Islands.

More information on the salvage operation may be obtained by writing to Commandant, 17th Naval District, care of Postmaster, Seattle, or to the Office of Naval Material, Navy Dept., Wash. 25, D. C.

Later this month a small group of steel and scrap officials will start for Korea to estimate how much battlefield metal can be shipped back to the United States. Some one guessed there may be nearly 100,000 tons of scrap available. The scrap mission is said to be backed by General Services Administration under the prompting of National Production Authority.

War scrap needs gentle handling. It can be full of unexploded shells, mines, etc. It takes a lot of manhours of preparation before a load can be declared safe for shipment on a ship. Costs naturally will rise high.

Government estimates of scrap stocks in various steelmaking centers (THE IRON AGE, July 26, p. 122) do not jibe with what industry thinks they are. For what the figures are worth, here is what the government believes inventories are:

1.54	months in Buffalo area
1.16	Chicago
1.24	Northern Ohio
1.10	Eastern Pennsylvania
1.97	Pittsburgh
1.11	New England
0.95	Mahoning Valley
0.62	Michigan
1.91	Northwest (Duluth)
1.76	Rocky Mountain area
1.51	St. Louis
2.28	South
1.50	Southwest
1.81	Pacific Coast

At odds with this estimate, the industry says it had about 15 days' stocks on hand at the end of May. June saw no improvement in stockpiles. Thus some of the government figures are off the beam and must be including scrap not available for furnaces, the thinking runs.

PITTSBURGH — Scrap consumers here are somewhat better off than they were a few weeks ago. Electric furnace producers particularly are said to have been able to build up their inventories to safer levels. As a result these mills have tightened up on their inspection standards. This is believed to be a temporary condition, however. The feeling is that supplies will grow worse in August.

CHICAGO—The scrap situation in the Chicago area remains on the quiet side this week. One major consumer has considerably improved its inventory picture in the last several weeks, according to sources in the trade. Movement of industrial and dealer scrap continues slow because of plant and yard vacations. A blast furnace at Wisconsin Steel works was shut down for repairs this week. Blast furnace grades continue fairly easy to obtain. Cast users, pretty well caught up on inventory, are said to be rejecting material which formerly would have been accepted without question. Dealer allocations continue at about the same rate.

PHILADELPHIA — Nothing startling has developed to alter the dull market in this district. Reduced business by gray iron foundries is reflected in ample stocks of foundry grades of cast. Buyers here are not so interested in imported scrap if delivery is more than 30 days forward. The opposite was true only a few weeks ago. No mills are facing immediate shutdowns and it may be that they are getting accustomed to shorter inventories for their cries have abated somewhat.

NEW YORK—A growth of allocations of scrap hit this district hard and suddenly last week. Some in the trade are not too pleased and call the increase confusing. Cast grades remain quite weak but an upsurge is expected by some in the fall. Foundries are being fussy over shipments and are not accepting upgraded material. Brokers are still hard at work on the scrap hunt. The market still shows sign of action but some say mill demands are not as loud or insistent.

DETROIT—There is little change in the Detroit scrap picture this week although cutbacks in auto output are already beginning to be reflected in a diminished flow of scrap from manufacturing establishments. Estimates place the reduction in plant scrap generated here at more than 20,000 tons per week as compared with a year ago. Outstate dealers go on allocation during August but the Detroit dealer situation remains unchanged. Efforts by local mills to build up scrap for the winter months have met with indifferent success, according to the trade.

CLEVELAND—A trucking strike here has hampered yard operators in the preparation of scrap. For the most part the yards depend on trucks for their supplies of oxygen tanks used in the cutting of scrap. One dealer was forced to lay off 20 burners for lack of oxygen. Inventory position of the mills has not improved or worsened.

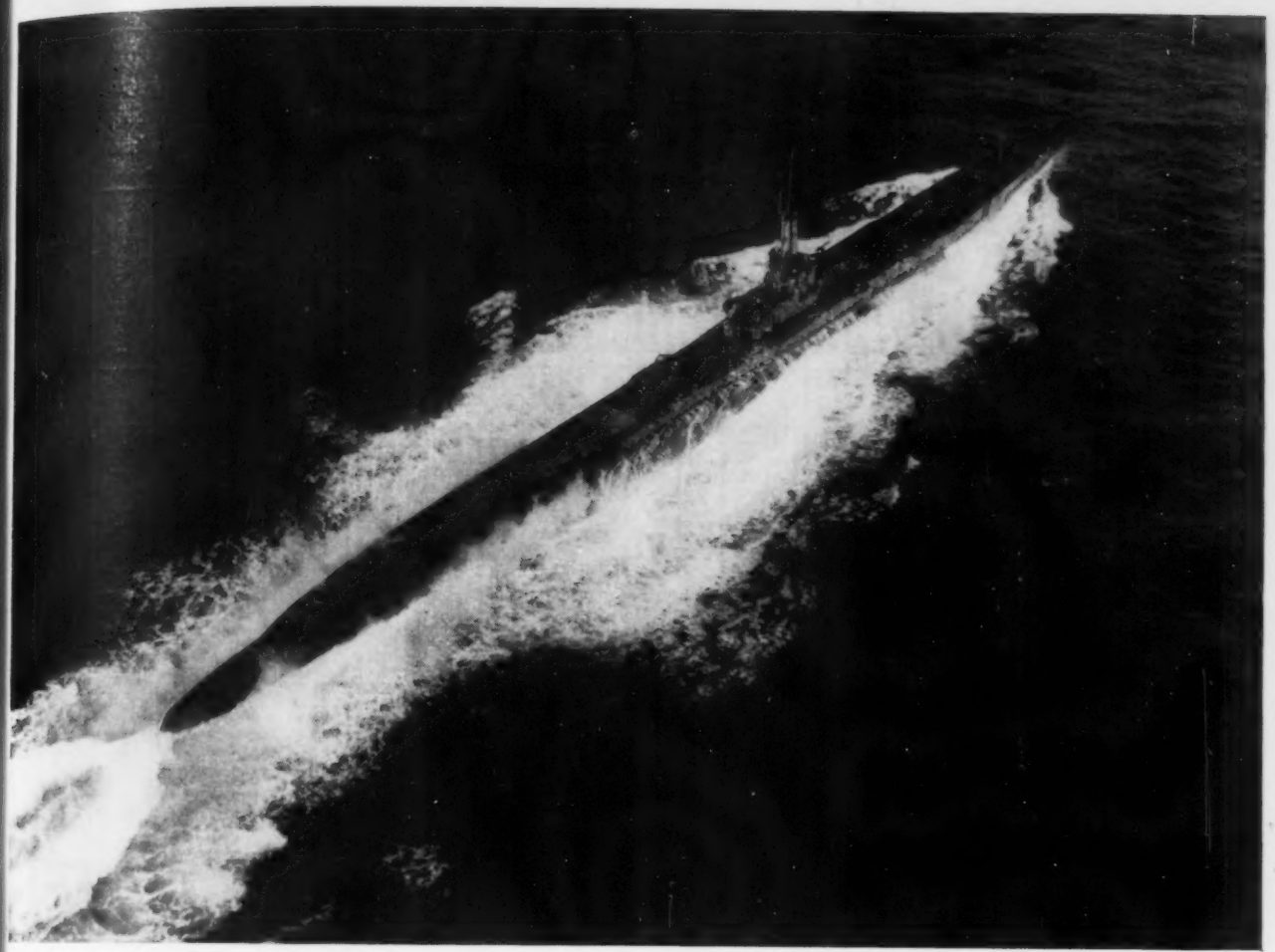
BIRMINGHAM—The cast iron market here is weak and brokers are finding it difficult to sell the mills and scrap yards are beginning to fill up. Better grades of steel, however, are about as hard to get as ever, with nearly everything being on allocation.

CINCINNATI—Virtually all openhearth scrap here is being allocated. Inventories in the hands of consumers is reported to be down to about 2 days. Electric furnace scrap is being allocated to foundries. Only blast furnace grades are free.

BOSTON—The supply and flow of scrap here in the New England area has continued to keep up with the demand. There is little or no change in activity with possibly one exception: more agricultural scrap is now being moved to the dealers.

ST. LOUIS—Shipments of scrap iron into the St. Louis industrial district continues to be retarded as a result of the floods throughout Missouri, Kansas and parts of Illinois. In sections not affected by the floods the weather has been too warm or the farmers too busy to worry about scrap collections. It was expected that local yards along the Mississippi will be in operation again this week, although those with presses may not be in readiness to take up this work for several weeks because of flood damage. Demand for foundry grades has eased and users are becoming more stringent in enforcing specifications.

BUFFALO—Mills still have a long way to go to replenish stockpiles but there has been a noted improvement in current receipts. A lull has developed in water receipts via the Lakes but three more fleets arrived by canal from the Eastern Seaboard. Allocations into this area continue substantial. Cast is easy.



Official Navy Photo, released by Dept. of Defense

It takes plenty of SCRAP ...to be ready for one!

Modern "sea monsters" like this, in America's expanding submarine fleet, are designed for far-ranging first-line defense of the world's free waters. For each giant new undersea craft, many tons of stainless and other nickel-bearing steels are needed ... much of which must be made from scrap. Keeping this type of scrap moving to the mills is an industry-wide job . . . and our No. 1 specialty.

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Iron and Steel

SCRAP PRICES

(Maximum basing point prices, per gross ton, as set by OPS, effective Feb. 7, 1951. Shipping point and delivered prices calculated as shown below.)

Switching Charge (Dollars per gross ton) →		$0.89	.75	.53	.65	.75	.51	.75	.75	.51	.75	.70	.76	.63	.65	.28	1.34	.79	.50	.20	.51	.51	.20	.52	.47	.51	.51	.51	.95	.50	.78	.50	.43	.51	.33	.57	.66	.55	.52	.69
Basing Points →		Pittsburgh	Johnstown	Brackenridge	Butler	Midland	Monessen	Sharon	Youngstown	Canton	Steubenville	Warren	Weirton	Cleveland	Buffalo	Cincinnati	Middletown	Chicago	Claymont	Coatesville	Conshohocken	Harrisburg	Phoenixville	Sparrows Pt.	Bethlehem	Ashland, Ky.	Kokomo, Ind.	Portsmouth, O.	St. Louis	Detroit	Duluth	Kansas City	Birmingham	Alabama City	Atlanta	Minneapolis	Houston	Los Angeles	Pittsburg, Cal.	Portland, Ore.	Seattle
GRADES	OPS No.																																							
No. 1 heavy melting	1	$44.00							$44.00					$43.00				$42.50						$42.00				$41.00	$41.15	$40.00	$39.50	$39.00			$38.00	$37.00				$38.00
No. 2 heavy melting	2	42.00							42.00					41.00				40.50						40.00				39.00	39.15	38.00	37.50	37.00			36.00	35.00				33.00
No. 1 busheling	3	44.00							44.00					43.00				42.50						42.00				41.00	41.15	40.00	39.50	39.00			38.00	37.00				35.00
No. 1 bundles	4	44.00							44.00					43.00				42.50						42.00				41.00	41.15	40.00	39.50	39.00			38.00	37.00				35.00
No. 2 bundles	5	41.00							41.00					40.00				39.50						39.00				38.00	38.15	37.00	36.50	36.00			35.00	34.00				32.00
Machine shop turnings	6	34.00							34.00					33.00				32.50						32.00				31.00	31.15	30.00	29.50	29.00			28.00	27.00				25.00
Mixed borings and turnings	7	38.00							38.00					37.00				36.50						36.00				35.00	35.15	34.00	33.50	33.00			32.00	31.00				29.00
Shovelling turnings	8	38.00							38.00					37.00				36.50						36.00				35.00	35.15	34.00	33.50	33.00			32.00	31.00				29.00
Cast iron borings	10	38.00							38.00					37.00				36.50						36.00				35.00	35.15	34.00	33.50	33.00			32.00	31.00				29.00
No. 1 chemical borings	26	41.00							41.00					40.00				39.50						39.00				38.00	38.15	37.00	36.50	36.00			35.00	34.00				32.00
Forge crops	11	51.50							51.50					50.50				50.00						49.50				48.50	48.65	47.50	47.00	46.50			45.50	44.50				42.00
Bar crops and plate	12	49.00							49.00					48.00				47.50						47.00				46.00	46.15	45.00	44.50	44.00			43.00	42.00				40.00
Punchings and plate	14	46.50							46.50					45.50				45.00						44.50				43.50	43.65	42.50	42.00	41.50			40.50	39.50				37.00
Electric furnace bundles	15	46.00							46.00					45.00				44.50						44.00				43.00	43.15	42.00	41.50	41.00			40.00	39.00				37.00
Cut struct., plate, 3 ft and less	16	47.00							47.00					46.00				45.50						45.00				44.00	44.15	43.00	42.50	42.00			41.00	40.00				38.00
Cut struct., plate, 2 ft and less	17	49.00							49.00					48.00				47.50						47.00				46.00	46.15	45.00	44.50	44.00			43.00	42.00				40.00
Cut struct., plate, 1 ft and less	18	50.00							50.00					49.00				48.50						48.00				47.00	47.15	46.00	45.50	45.00			44.00	43.00				41.00
Foundry steel, 2 ft and less	20	46.00							46.00					45.00				44.50						44.00				43.00	43.15	42.00	41.50	41.00			40.00	39.00				37.00
Foundry steel, 1 ft and less	21	48.00							48.00					47.00				46.50						46.00				45.00	45.15	44.00	43.50	43.00			42.00	41.00				39.00
Heavy trimmings	24	43.00							43.00					42.00				41.50						41.00				40.00	40.15	39.00	38.50	38.00			37.00	36.00				34.00
No. 1 RR heavy melting	RR 1	46.00							46.00					45.00				44.50						44.00				43.00	43.15	42.00	41.50	41.00			40.00	39.00				37.00
Scrap rails, random lengths	RR 14	48.00							48.00					47.00				46.50						46.00				45.00	45.15	44.00	43.50	43.00			42.00	41.00				39.00
Scrap rails, 3 ft and less	RR 16	51.00							51.00					50.00				49.50						49.00				48.00	48.15	47.00	46.50	46.00			45.00	44.00				42.00
Scrap rails, 2 ft and less	RR 17	52.00							52.00					51.00				50.50						50.00				49.00	49.15	48.00	47.50	47.00			46.00	45.00				43.00
Scrap rails, 18 in. and less	RR 18	54.00							54.00					53.00				52.50						52.00				51.00	51.15	50.00	49.50	49.00			48.00	47.00				45.00
Rerolling rails	RR 15	53.00							53.00					52.00				51.50						51.00				50.00	50.15	49.00	48.50	48.00			47.00	46.00				44.00
Uncut tires	RR 20	48.00							48.00					47.00				46.50						46.00				45.00	45.15	44.00	43.50	43.00			42.00	41.00				39.00
Cut tires	RR 21	51.00							51.00					50.00				49.50						49.00				48.00	48.15	47.00	46.50	46.00			45.00	44.00				42.00
Cut bolsters and side frames	RR 23	49.00							49.00					48.00				47.50						47.00				46.00	46.15	45.00	44.50	44.00			43.00	42.00				40.00
RR specialties	RR 24, 28, 29	51.00							51.00					50.00				49.50						49.00				48.00	48.15	47.00	46.50	46.00			45.00	44.00				42.00
Solid steel axles	RR 25	58.00							58.00					57.00				56.50						56.00				55.00	55.15	54.00	53.50	53.00			52.00	51.00				49.00
No. 3 steel wheels	RR 27	51.00							51.00					50.00				49.50						49.00				48.00	48.15	47.00	46.50	46.00			45.00	44.00				42.00

Cast Scrap

(F.o.b. all shipping points)

Grades	OPS No.	
Cupola cast	1	$49.00
Charging box cast	3	47.00
Heavy breakable cast	3	45.00
Cast iron brake shoes	5	41.00
Stove plate	6	46.00
Clean auto cast	7	52.00
Unstripped motor blocks	8	43.00
Cast iron carwheels	9	47.00
Malleable	10	55.00
Drop broken mach'y. cast	11	52.00

Ceiling price of clean cast iron foundry runouts or prepared cupola drops is 75 pct of corresponding grade.

SWITCHING DISTRICTS—These basing points include the indicated switching districts: Pittsburgh; Bessemer, Homestead, Duquesne, Munhall. Cincinnati; Newport. St. Louis; Granite City, East St. Louis, Madison, and Federal, Ill. San Francisco; South San Francisco, Niles, Oakland. Claymont; Chester. Chicago; Gary.

SHIPPING POINT PRICES (Except RR scrap)—For shipping points within basing points, the ceiling shipping point price is the basing point price, less switching charge. The ceiling for shipping points outside basing points is the basing point price yielding the highest shipping point price, less the lowest established freight charge. Dock charge, where applicable, is $1.25 per gross ton except: Memphis, 95¢; Great Lakes ports, $1.50, and New England ports, $1.75. Maximum shipping point price on No. 1 heavy melting steel in New York City is $36.99 per gross ton with set differentials for other grades. Hudson and Bergen County, N. J., shipping point prices are computed from Bethlehem basing point. All New Jersey computations use all-rail transport. Ceiling need not fall below $32 per gross ton for No. 1 heavy melting steel, with set differentials for other grades. Cast scrap shipping point prices are given in table.

DELIVERED PRICES (RR scrap)—Ceiling on-line price of a RR operating in a basing point is the top in the highest priced basing point in which the RR operates. For off-line prices, RR's not operating in basing point, non-operating RR's, and RR scrap sold by someone other than a RR see text of order, THE IRON AGE, Feb. 8, 1951, p. 137-C.

DELIVERED PRICES (Except RR scrap)—Ceiling is the shipping point price plus actual freight charge, tax included. Dock charges, where applicable, are as above.

UNPREPARED SCRAP—Ceiling price is $8 a ton less than prepared base grades (No. 1 heavy & No. 1 RR heavy). Scrap suitable for compressing into No. 1 bundles is $6 less than No. 1 bundles; suitable for compressing into No. 2 bundles, $8 less than No. 2 bundles. For cast material requiring special preparation, price is breakable cast less preparation costs.

COMMISSIONS—Brokers are permitted a maximum of $1 per gross ton commission which must be separate on the bill.

ALLOY PREMIUMS—These alloy extras are permitted: Nickel; $1.25 may be added to price of No. 1 heavy for each 0.25 pct nickel between 1 and 5.25 pct. **Molybdenum**; $2 may be added to price of No. 1 heavy for molybdenum over 0.15 pct, $3 for content over 0.65 pct. **Manganese**; $4 may be added to price of No. 1 heavy or No. 1 RR heavy for content over 10 pct if scrap is in sizes over 8 x 12 x 24 in., $14 if less than 8 x 12 x 24 in. Manganese premium applicable only if sold for electric furnace use or on NPA allocation. **Silicon**: electric furnace and foundry grade adjustments are not applicable if silicon content is between 0.5 and 1.75 pct. **Chromium**; $1 may be added if scrap conforms to SAE 52100 analysis. **Multiple Alloys**; if scrap contains two premium alloy elements, total premium may not exceed ceiling premium for any one contained alloy.

RESTRICTONS ON USE—Ceiling prices on some scrap items may fluctuate with use by consumers. If some scrap is purchased for its established specialized use, the ceiling price set in the order stands. But if some special grades are purchased for other uses, the ceiling price charge shall be the price of the scrap grade being substituted. For example, the price established for Grade 28 (wrought iron) may be charged only when sold to a producer of wrought iron. Otherwise the ceiling price shall not exceed the ceiling price for the corresponding grade of basic openhearth. Restrictions on use are placed on the following grades: Chemical borings, wrought iron and rerolling rails, cupola cast, billet, bloom, and forge crops, Nos. 1 and 2 chemical borings. Ceiling prices on billet bloom and forge crops, alloy-free turnings, and heavy turnings may be charged only when shipped directly from industrial producer. NPA prohibits openhearth users from buying electric furnace grades, Nos. 11 through 18, foundry grades, Nos. 10 and 21 and cast grades, 1, 7, 9 and 11.

CEILING INTRANSIT PREPARATION CHARGES (Dollars per gross ton)

No. 1 heavy; No. 2 heavy; No. 1 RR heavy; No. 2 RR heavy; No. 1 busheling; No. 2 bundles; electric furnace bundles	$ 8.00
No. 1 bundles; briquetted turnings or cast iron borings; No. 1 RR sheet scrap	6.00
Crushing machine shop turnings	3.00
Bar crops and plate, cast steel, punchings and plate, cut structural and plate, 3 ft and under, foundry steel, 2 ft and under, wrought iron	10.00
Structural, plate scrap, 2 ft and less, foundry steel 1 ft and less	11.00
Structural and plate scrap, 1 ft and less	12.00
Rails, 3 ft & less; cut tires; cut bolsters & side frames	4.00
Rails, 2 ft & less	5.00
Rails, 18 in. & less	7.00

Hamilton, Ontario

(Consumers buying prices, del'd gross ton)

Hvy. melting steel	$35.00
No. 1 bundles	35.00
No. 2 bundles	34.50
Mechanical bundles	33.00
Mixed, steel scrap	31.00
Rails, remelting	35.00
Rails, rerolling	38.00
Bushelings	29.50
Bushelings, prepared new factory	33.00
Bushelings, unprepared new factory	25.00
Short steel turnings	28.00
Mixed borings, turnings	28.00
Cast scrap	58.00 to 60.00

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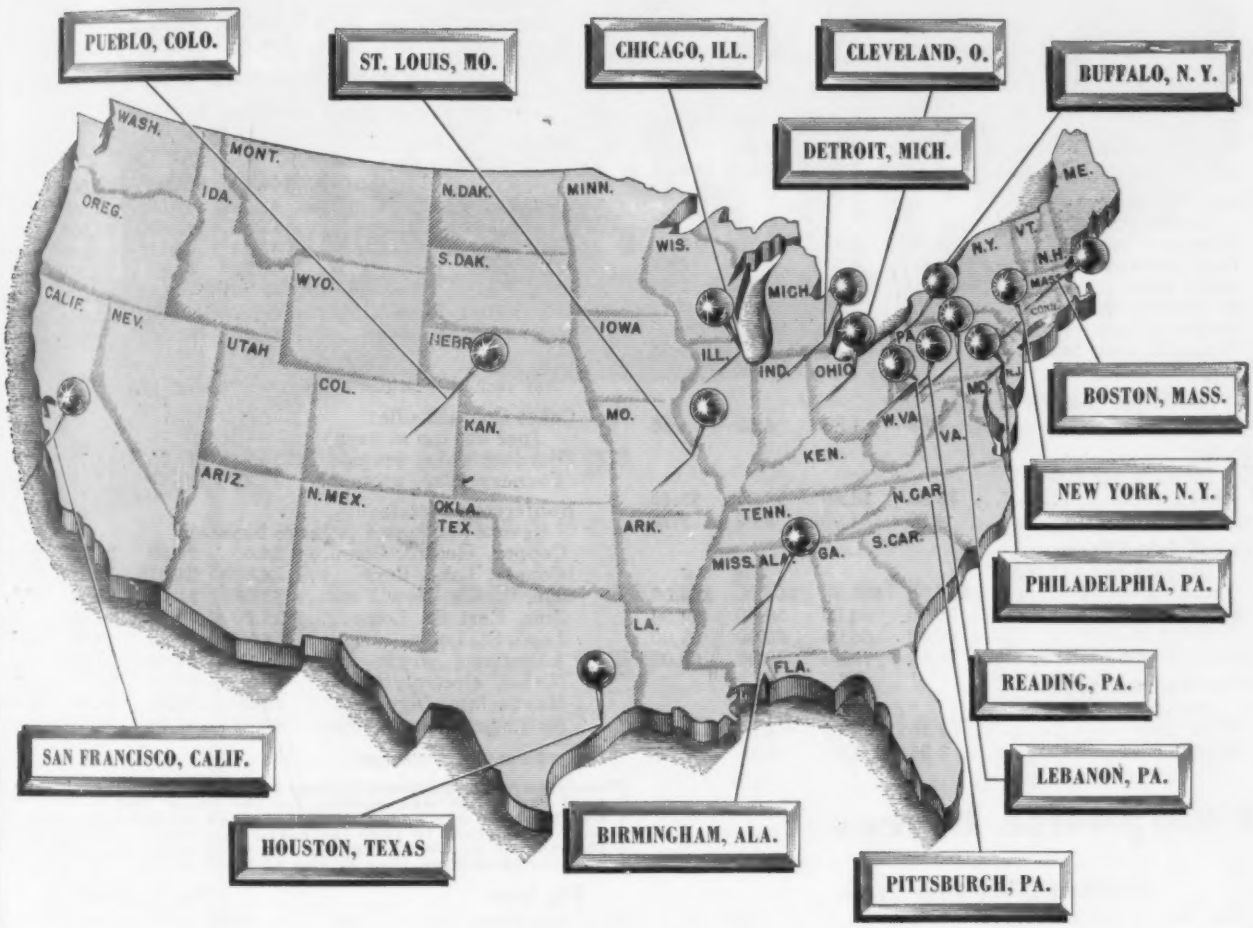

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices in this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	July 31, 1951	July 24, 1951	July 3, 1951	Aug. 1 1950
Hot-rolled sheets	3.60	3.60	3.60	3.35
Cold-rolled sheets	4.35	4.35	4.35	4.10
Galvanized sheets (10 ga)	4.80	4.80	4.80	4.40
Hot-rolled strip	3.50	3.50	3.50	3.25
Cold-rolled strip	4.75	4.75	4.75	4.21
Plate	3.70	3.70	3.70	3.50
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	36.75	36.75	36.75	33.00
Tin and Ternplate: (dollars per base box)				
Tinplate (1.50 lb.) cokes	$8.70	$8.70	$8.70	$7.50
Tinplate, electro (0.50 lb.)	7.40	7.40	7.40	6.60
Special coated mfg. ternes	7.50	7.50	7.50	6.35
Bars and Shapes: (cents per pound)				
Merchant bars	3.70	3.70	3.70	3.45
Cold finished bars	4.55	4.55	4.55	4.145
Alloy bars	4.30	4.30	4.30	3.95
Structural shapes	3.65	3.65	3.65	3.40
Stainless bars (No. 302)	31.50	31.50	31.50	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.85	4.85	4.85	4.50
Rails: (dollars per 100 lb)				
Heavy rails	$3.60	$3.60	$3.60	$3.40
Light rails	4.00	4.00	4.00	3.75
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$56.00	$56.00	$56.00	$54.00
Slabs, rerolling	56.00	56.00	56.00	54.00
Forging billets	66.00	66.00	66.00	63.00
Alloy blooms billets, slabs	70.00	70.00	70.00	66.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	4.10	4.10	4.10	3.85
Skelp	3.35	3.35	3.35	3.15

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*

Pig Iron: (per gross ton)	July 31, 1951	July 24, 1951	July 3, 1951	Aug. 1 1950
No. 2 foundry, del'd Phila.	$57.77	$57.77	$57.77	$50.42
No. 2, Valley furnace	52.50	52.50	52.50	46.50
No. 2, Southern Cin'ti	55.58	55.58	55.58	49.08
No. 2, Birmingham	48.88	48.88	48.88	42.38
No. 2, foundry, Chicago†	52.50	52.50	52.50	46.50
Basic del'd Philadelphia	56.92	56.92	56.92	49.92
Basic, Valley furnace	52.00	52.00	52.00	46.00
Malleable, Chicago†	52.50	52.50	52.50	46.50
Malleable, Valley	52.50	52.50	52.50	46.50
Charcoal, Chicago	70.56	70.56	70.56	68.56
Ferromanganese‡	186.25	186.25	186.25	173.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$44.00*	$44.00*	$44.00*	$41.75
No. 1 steel, Phila. area	42.50*	42.50*	42.50*	32.50
No. 1 steel, Chicago	42.50*	42.50*	42.50*	37.75
No. 1 bundles, Detroit	41.15*	41.15*	41.15*	38.25
Low phos. Young'n	46.50*	46.50*	46.50*	43.50
No. 1 cast, Pittsburgh	49.00†	49.00†	49.00†	43.75
No. 1 cast, Philadelphia	49.00†	49.00†	49.00†	39.50
No. 1 cast, Chicago	49.00†	49.00†	49.00†	47.50

*Basing Pt. †Shipping Pt.
Not including broker's fee after Feb. 7, 1951.

Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75	$14.75	$14.75	$14.25
Foundry coke, prompt	17.75	17.75	17.75	16.25

Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	24.50	24.50	24.50	22.50
Copper, Lake, Conn.	24.625	24.625	24.625	22.625
Tin, Straits, New York	$1.06†	$1.06	$1.06	97.50
Zinc, East St. Louis	17.50	17.50	17.50	15.00
Lead, St. Louis	16.80	16.80	16.80	11.80
Aluminum, virgin	19.00	19.00	19.00	17.50
Nickel, electrolytic	59.58	59.58	59.58	51.22
Magnesium, ingot	24.50	24.50	24.50	22.50
Antimony, Laredo, Tex.	42.00	42.00	42.00	24.50

†Tentative. *Revised.

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 130 of May 12, 1949, issue.)

	Finished Steel Base Price	Pig Iron	Scrap Steel
July 31, 1951	4.131¢ per lb.	$52.69 per gross ton	$43.00 per gross ton
One week ago	4.131¢ per lb.	52.69 per gross ton	43.00 per gross ton
One month ago	4.131¢ per lb.	52.69 per gross ton	43.00 per gross ton
One year ago	3.837¢ per lb.	46.38 per gross ton	39.17 per gross ton

	Finished Steel Base Price High		Finished Steel Base Price Low		Pig Iron High		Pig Iron Low		Scrap Steel High		Scrap Steel Low	
1951	4.131¢	Jan. 2	4.131¢	Jan. 2	$52.69	Jan. 2	$52.69	Jan. 2	$47.75	Jan. 30	$43.00	Feb. 7
1950	4.131¢	Dec. 1	3.837¢	Jan. 3	52.69	Dec. 12	45.88	Jan. 3	45.13	Dec. 19	26.25	Jan. 3
1949	3.837¢	Dec. 27	3.3705¢	May 3	46.87	Jan. 18	45.88	Sept. 6	43.00	Jan. 4	19.33	June 28
1948	3.721¢	July 27	3.193¢	Jan. 1	46.91	Oct. 12	39.58	Jan. 6	43.16	July 27	39.75	Mar. 9
1947	3.193¢	July 29	2.848¢	Jan. 1	37.98	Dec. 30	30.14	Jan. 7	42.58	Oct. 28	29.50	May 20
1946	2.848¢	Dec. 31	2.464¢	Jan. 1	30.14	Dec. 10	25.37	Jan. 1	31.17	Dec. 24	19.17	Jan. 1
1945	2.464¢	May 29	2.396¢	Jan. 1	25.37	Oct. 23	23.61	Jan. 2	19.17	Jan. 2	18.92	May 22
1944	2.396¢		2.396¢		$23.61		$23.61		19.17	Jan. 11	15.76	Oct. 24
1943	2.396¢		2.396¢		23.61		23.61		$19.17		$19.17	
1942	2.396¢		2.396¢		23.61		23.61		19.17		19.17	
1941	2.396¢		2.396¢		$23.61	Mar. 20	$23.45	Jan. 2	$22.00	Jan. 7	$19.17	Apr. 10
1940	2.30467¢	Jan. 2	2.24107¢	Apr. 16	23.45	Dec. 23	22.61	Jan. 2	21.83	Dec. 30	16.04	Apr. 9
1939	2.35367¢	Jan. 3	2.26689¢	May 16	22.61	Sept. 19	20.61	Sept. 12	22.50	Oct. 3	14.08	May 16
1938	2.58414¢	Jan. 4	2.27207¢	Oct. 18	23.25	June 21	19.61	July 6	15.00	Nov. 22	11.00	June 7
1937	2.58414¢	Mar. 9	2.32263¢	Jan. 4	32.25	Mar. 9	20.25	Feb. 16	21.92	Mar. 30	12.67	June 9
1936	2.32263¢	Dec. 28	2.05200¢	Mar. 10	19.74	Nov. 24	18.73	Aug. 11	17.75	Dec. 21	12.67	June 8
1932	1.89196¢	July 5	1.83910¢	Mar. 1	14.81	Jan. 5	13.56	Dec. 6	8.50	Jan. 12	6.43	July 5
1929	2.31773¢	May 28	2.26498¢	Oct. 29	18.71	May 14	18.21	Dec. 17	17.58	Jan. 29	14.08	Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Always Your Best Market for

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IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$52.00[1]													
Alloy, net ton	$54.00[1,17]													$54.00[31]
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$56.00[1,5]	$56.00[1]	$56.00[1]						$56.00[3]		$56.00[3]			
Carbon forging billets, net ton	$66.00[1,5]	$66.00[1,4]	$66.00[1]	$66.00[4]	$66.00[4]				$66.00[3,4]	$73.00[26]	$66.00[3]			$68.00[31]
Alloy, net ton	$70.00[1,17,6]	$70.00[1,4]	$70.00[1,6]		$70.00[4]			$70.00[3]	$70.00[3,4]	$77.00[26]	$70.00[3]			$73.00[31]
PIPE SKELP	3.35[1] 3.45[5]						3.35[1,4]							
WIRE RODS	4.10[2] 4.30[18]	4.10[2,4,33]	4.10[6]	4.10[2]			4.10[6]		4.10[65]		4.10[3]	4.20[3]		
SHEETS Hot-rolled (18 ga. & hvr.)	3.60[1,5,9,15] 3.75[28]	3.60[9,23]	3.60[1,6,9]	3.60[4,5]		3.60[7]	3.60[1,4,6] 4.00[13]		3.60[3]	4.00[26]		3.60[3]	4.30[33]	3.80[31] 4.40[47]
Cold-rolled	4.35[1,5,9,15,7]		4.35[1,6,9]	4.35[4,5]		4.35[7]	4.35[4,6]		4.35[3]			4.35[3]	5.05[33]	4.55[31]
Galvanized (10 gage)	4.80[1,9,15]		4.80[1,9]		4.80[4]	4.80[7]	5.50[44] 6.00[64]					4.80[3]	5.50[33]	
Enameling (12 gage)	4.65[1]		4.65[1,9]	4.65[4]		4.65[7]	4.65[6]						5.35[33]	
Long terne (10 gage)	5.20[9,15]		5.20[1]			5.20[7]	6.00[64]							
Hi str. low alloy, h.r.	5.40[1,5] 5.75[9]	5.40[1]	5.40[1,9] 5.90[6]	5.40[4,5]			5.40[1,4,13] 5.90[6]		5.40[3]	5.65[26]		5.40[3]		5.95[31]
Hi str. low alloy, c.r.	6.55[4,5] 6.90[9]		6.55[1,9] 7.05[6]	6.55[4,5]			6.55[4] 7.05[6]		6.55[3]			6.55[3]		7.10[31]
Hi str. low alloy, galv.	7.20[1]											6.75[3]		
STRIP Hot-rolled	3.60[9], 4.00[41,58], 3.75[28] 3.50[5,7]	3.50[56]	3.50[1,6,9]			3.50[7]	3.50[1,4,6] 4.00[13]		3.50[3,4]	3.90[26]	3.50[3]	3.50[3]		4.40[47] 3.80[31]
Cold-rolled	4.65[5,7,9] 5.00[28] 5.35[40,63,58]	4.90[9,65]	4.90[6]	4.65[2,5]		4.65[7]	4.65[4,6] 5.25[28,49] 5.35[13,40]		4.65[3]			4.65[3]		4.85[31] 5.45[47] 5.60[58,61]
Hi str. low alloy, h.r.	5.75[9]		5.50[1] 5.30[9], 5.80[6]				4.95[4], 5.50[1] 5.40[13], 5.80[6]		4.95[3]	5.55[26]		4.95[3]		6.05[31]
Hi str. low alloy, c.r.	7.20[9]			6.55[2] 6.70[5]			(6.20[4], 6.55[13] 7.05[6]		6.40[3]			6.40[3]		
TINPLATE† Cokes, 1.25-lb base box (1.50 lb, add 25¢)	$8.45[1,5,9,15]		$8.45[1,6,9]				$8.45[4]					$8.55[3]		
Electrolytic 0.25, 0.50, 0.75 lb box	0.25 lb base box, $7.15[1,4,5,8,9]; $7.25[3,11]; $7.35[32] 0.50 lb, add 25¢; 0.75 lb add 65¢													
BLACKPLATE, 29 gage Hollowware enameling	5.85[1] 6.15[18]		5.85[1]				5.30[4]							
BARS Carbon steel	3.70[1,5] 3.85[9]	3.70[1,4,33]	3.70[1,4,6,9]	3.70[4]	3.70[4]		3.70[1,4,6]		3.70[3,4]		3.70[3]			3.80[31]
Reinforcing	3.70[1,5]	3.70[4]	3.70[1,6,9]	3.70[4]			3.70[1,4,6]		3.70[3,4]		3.70[3]	3.70[3]		
Cold-finished	4.55[2,4,5,52,69,71]	4.55[2,33,70]	4.55[4,74,73]	4.55[2]	4.55[4,32]		4.55[6,57]		4.60[70]					4.70[4]
Alloy, hot-rolled	4.30[1,17]	4.30[1,4,33]	4.30[1,6,9]		4.30[4]		4.30[1,6]	4.30[6]	4.30[3,4]		4.30[3]			4.45[31] 4.60[11]
Alloy, cold-drawn	5.40[17,52,69,71,3]	5.40[4,33,69,70,73] 5.45[3]	5.40[4,73,74]		5.40[4,32]		5.40[6,35,57]	5.40[3]	5.40[3]					5.50[4]
Hi str. low alloy, h.r.	5.55[1,5]		5.55[1,6] 6.05[6]	5.55[4,5]			5.55[1] 6.05[6]	5.55[3]	5.55[3]		5.55[3]			
PLATE Carbon steel	3.70[1,5,15] 4.00[9]	3.70[1,33]	3.70[1,6,9]	3.70[4,5]			3.70[1,4,6] 3.95[13]		3.70[3]	4.15[26]	3.70[3]	3.70[3]	4.40[33]	
Floor plates	4.75[1]	4.75[1]	4.75[6]	4.75[5]						4.75[26]				
Alloy	4.75[1]	4.75[1]	4.75[1]				5.20[13]			5.05[26]	4.75[3]	4.75[3]		
Hi str. low alloy	5.65[1,5]	5.65[1]	5.65[1,6] 6.15[6]	5.65[4,5]			(5.65[4] 5.70[13] (6.15[6]			5.90[26]	5.65[3]	5.65[3]		
SHAPES, Structural	3.65[1,5] 3.90[9]	3.65[1,33]	3.65[1,6]					3.70[3]	3.70[3]		3.70[3]			
Hi str. low alloy	5.50[1,5]	5.50[1]	5.50[1,9] 6.00[6]				6.00[6]	5.50[3]	5.50[3]		5.50[3]			
MANUFACTURERS' WIRE Bright	4.85[2,5] 5.10[18]	4.85[2] 4.33,34		4.85[2]			4.85[6]	Kokomo—4.95[30] 4.85[65]			4.85[3]	4.95[3]	Duluth—4.85[3]	
PILING, Steel Sheet	4.45[1]	4.45[1]	4.45[3]						4.45[3]					

STEEL PRICES

Smaller numbers indicate producing companies. See key at right.
Prices are in cents per lb unless otherwise noted. Extras apply.

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
			F=$79.00[19]		INGOTS Carbon forging, net ton
	$82.00[83]		F=$80.00[19]		Alloy, net ton
		$56.00[11]	F=$75.00[19]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$74.00[83]	$66.00[11]	F=$85.00[19] SF, LS, S=$85.00[62]	Geneva=$86.00[16]	Carbon forging billets, net ton
	$79.00[83]		F=$89.00[19] LA=$90.00[62]		Alloy net ton
					PIPE SKELP
				Worcester=4.40[2] Minnequa=4.35[14] Portsmouth=4.30[20]	
	4.50[83]	4.10[4-11]	SF=4.90[3], F=4.90[19] LA=4.90[24-62]		WIRE RODS
		3.60[4-11]	SF, LA=4.30[24] F=4.55[19]	Niles=5.25[84], Geneva=3.70[16] Ashland=3.80[7]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.35[11]	SF=5.30[24] F=5.30[19]		Cold-rolled
		4.80[4-11]	SF, LA=5.25[24]	Ashland=4.80[7] Kokomo=5.20[30]	Galvanized (10 gage)
				Ashland=4.65[7]	Enameling (12 gage)
					Long ternes (10 gage)
		5.40[11]	F=6.35[19]		Hi str. low alloy, h.r.
			F=7.50[19]		Hi str. low alloy, c.r.
					Hi str. low alloy, galv.
4.10[83]	4.90[83]	3.50[4-11]	SF, LA=4.25[24-62] F=4.75[19], S=4.50[62]	Atlanta=4.05[65] Minnequa=4.55[14] Ashland=3.50[7]	STRIP Hot-rolled
			F=6.30[19] LA=6.40[27]	New Haven=5.15[2], 5.85[58] Trenton=6.00[45]	Cold-rolled
		5.30[11]	F=6.20[19] SF, LA=6.05[62] S=6.30[62]		Hi str. low alloy, h.r.
			F=6.95[19]		Hi str. low alloy, c.r.
		$8.55[11]	SF=9.20[24]		TINPLATE Cokes, 1.25-lb base box (1.50 lb, add 25¢)
					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.30[83]	4.10[83]	3.70[4-11]	SF, LA=4.40[24]	Atlanta=4.25[65] Minnequa=4.15[14]	BARS Carbon steel
4.30[83]	4.10[83]	3.70[4-11]	SF, S=4.45[62] F=4.40[19], LA=4.40[62]	Atlanta=4.25[65] Minnequa=4.50[14]	Reinforcing
			LA=6.00[4]	Newark=5.00[69] Putnam=5.10[69] Hartford=5.10[4]	Cold-finished
4.90[83]	4.70[83]		LA=5.35[62] F=5.35[19]		Alloy, hot-rolled
				Newark=5.75[69] Worcester=5.75[2] Hartford=5.85[4]	Alloy, cold-drawn
		5.55[11]	F=6.60[19] SF, S=6.30[62] LA=6.25[62]		Hi str. low alloy, h.r.
	4.10[83]	3.70[4-11]	F=4.30[19] S=4.60[62]	Claymont=4.15[20] Coatesville=4.15[21] Minnequa=4.50[14] Geneva=3.70[16]	PLATE Carbon steel
				Harrisburg=5.25[35]	Floor plates
			F=5.70[19]	Coatesville=5.25[21] Claymont=4.85[20]	Alloy
		5.65[11]	F=6.25[19] S=6.55[62]	Geneva=5.65[16]	Hi str. low alloy
4.25[83]	4.05[83]	3.60[4] 3.65[11]	SF=4.20[62] F=4.25[16] LA=4.25[24-62] S=4.30[62]	Geneva 3.65[16] Minnequa 4.10[14]	SHAPES, Structural
		5.50[11]	SF=6.10[62-19] SF=6.00[62] LA=6.05[62]	Geneva=5.50[16]	Si str. low alloy
5.45[83]	5.25[83]	4.85[4-11]	SF, LA=5.80[24]	Atlanta=5.10[65] Worcester=5.15[2] Minnequa=5.10[14] Portsmouth=5.25[20]	MANUFACTURERS' WIRE Bright

†Special coated mfg ternes deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct $2.20 from 1.25-lb coke base box.

Key to Steel Producers

1 U. S. Steel Co., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Steel Corp., Oakland, Calif.
20 Portsmouth Div., Detroit Steel Corp., Detroit
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calstrip Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Claymont Steel Corp., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling St. & Carbide Corp., McKeesport
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Fran.
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wycoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Hammond, Ind.
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit
85 Wickwire Spencer Steel, Buffalo
86 Angell Nail and Chaplet, Cleveland
87 Mid-States Steel & Wire, Crawfordsville, Ind.
88 National Supply, Pittsburgh, Pa.
89 Wheatland Tube Co., Wheatland, Pa.
90 Mercer Tube & Mfg. Co., Sharon, Pa.
91 Woodward Iron Co., Woodward, Ala.
92 Sloss-Sheffield Steel & Iron Co., Birmingham
93 Hanna Furnace Corp., Detroit
94 Interlake Iron Corp., Cleveland
95 Lone Star Steel Co., Dallas
96 Mystic Iron Works, Everett, Mass.
97 Jackson Iron & Steel Co., Jackson, O.
98 Globe Iron Co., Jackson, O.
99 Pittsburgh Coke & Chemical Co., Pittsburgh
100 Shenango Furnace Co., Pittsburgh
101 Tennessee Products & Chem. Corp., Nashville
102 Koppers Co., Inc., Granite City, Ill.
103 Page Steel & Wire Div., American Chain & Cable, Monessen, Pa.
104 Wallingford Steel Co., Wallingford, Conn.

STAINLESS STEELS

Base price cents per lb f.o.b. mill.

Product	301	302	303	304	316	321	347	410	416	430
Ingots rerolling	14.25	15.25	16.75	16.25	24.75	20.00	21.75	12.75	14.75	13.00
Slabs billets rerolling	16.50	20.00	22.00	21.00	32.25	26.25	28.50	16.50	20.00	16.75
Forg. discs die blocks rings	34.00	34.25	36.75	35.75	53.00	40.25	44.75	28.00	28.50	28.50
Billets forging	26.25	26.50	28.50	27.75	41.50	31.25	35.00	21.50	22.00	22.00
Bars wires structurals	31.25	31.50	34.00	33.00	49.25	37.00	41.50	25.75	26.25	26.25
Plates	33.00	33.25	35.25	35.25	52.00	40.75	45.25	27.00	27.50	27.50
Sheets	41.00	41.25	43.25	43.25	57.00	49.25	53.75	36.50	37.00	39.00
Strip hot-rolled	26.50	28.25	32.50	30.25	48.75	37.00	41.25	23.50	30.25	24.00
Strip cold-rolled	34.00	36.75	40.25	38.75	59.00	48.25	52.25	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38 (type 316 add 4, 5¢), 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 45.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38 (type 316 add 4, 5¢); W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, Pa., 13; Butler, Pa., 7; Wallingford, Conn., 104.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28; Monessen, 103; Syracuse, N. Y., 17; Bridgeville, Pa., 59.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44; Syracuse, N. Y., 17.

Plates: Brackenridge, Pa., 28 (type 416 add ½¢); Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 17; Syracuse, 17; Ferndale, Mich., 28; Washington, Pa., 39.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1; Syracuse, N. Y., 17.

*ALLEGHENY LUDLUM—Slightly higher on Type 301; slightly lower on others in 300 Series.

WASHINGTON STEEL—Slightly lower on 300 Series except where noted.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Base Col.	Woven Wire Fence 9-15½ ga. Base Col.	Fence Posts Base Col.	Single Loop Bale Ties Base Col.	Twisted Barbless Wire Base Col.	Gal. Barbed Wire Base Col.	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Gal. (1) ¢/lb.
Alabama City-4	118	126		123		136	5.70	5.95
Aliquippa, Pa.-5	118	132			136	140	5.70	6.15
Atlanta-65	121	133		126	126	143	5.95	6.40
Bartonville-34	118	138		123	143	143	5.70	6.15
Buffalo-85							4.65	
Cleveland-86	125							
Cleveland-2							5.70	6.15
Crawfordsville-87		132				145	5.95	6.40
Donora, Pa.-2	118	130		123	140	140	5.70	6.15
Duluth-2	118	130		123	140	140	5.70	6.15
Fairfield, Ala.-11	118	130		123		140	5.70	6.15
Houston-83	126	138				148	6.10	6.55
Johnstown, Pa.-3	118	130			140		5.70	6.15
Joliet, Ill.-2	118	130		123		140	5.70	6.15
Kokomo, Ind.-30	120	132		125	138	142	5.80	6.05
Los Angeles-62							6.65	
Kansas City-83	130			135		152	6.30	6.75
Minnequa-14	123	138	130	128	146	146	5.95	6.45
Monessen-18	124	135				145	5.95	6.40
Moline, Ill.-4			136					
Pittsburg, Cal.-24	137			147	156	160	6.65	6.80
Portsmouth-20	124	137			147	147	6.10	6.60
Rankin, Pa.-2	118	130			140	140	5.70	6.15
So. Chicago, Ill.-4	118	126	140	123		136	5.70	5.95
S. San Fran.-14				147		160	6.65	7.10
Sparrows Pt.-3	120			125	142	142	5.80	6.25
Sterling, Ill.-33	118	130		123	140	140	5.70	6.15
Struthers, Ohio-6							5.70	6.15
Torrance, Cal.-24	138						6.65	
Worcester-2	124						6.00	6.45
Williamsport, Pa.-51			150					

Cut Nails, carloads, base, $7.35 per 100 lb (less 20¢ to jobbers), at Conshohocken, Pa., (26), Wheeling, W. Va., (15), $7.15.

(1) Alabama City and So. Chicago do not include zinc extra.

CAST IRON WATER PIPE

Per Net Ton

6 to 24-in., del'd Chicago, $105.30 to $108.80
6 to 24-in., del'd N. Y. ... 108.50 to 109.50
6 to 24-in., Birmingham. 91.50 to 96.00
6-in and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less ..... 123.00 to 130.00
Class "A" and as pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

PIPE AND TUBING

Base discounts, f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS					
	½ in.		¾ in.		1 in.		1¼ in.		1½ in.		2 in.		2½-3 in.		2 in.		2½-3 in.		3½-4in.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
STANDARD T. & C.																				
Sparrows Pt.-3	34.0	12.0	37.0	16.0	39.5	19.5	40.0	20.0	40.5	21.0	41.0	21.5	41.5	22.0						
Cleveland-4	36.0	14.0	39.0	18.0	41.5	21.5	42.9	22.0	42.5	23.0	43.0	23.5	43.5	24.0						
Oakland-19	25.0	3.0	28.0	7.0	30.5	10.5	31.0	11.0	31.5	12.0	32.0	12.5	32.5	13.0						
Pittsburgh-5	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.5	8.0	32.5	11.5	34.5	13.5
Pittsburgh-10	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
St. Louis-32	35.0	13.0	38.0	17.0	40.5	20.5	41.0	21.0	41.5	22.0	42.0	22.5	42.5	23.0						
Sharon-90	36.0	13.0	39.0	17.0	41.5	20.0	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.0						
Pittsburgh-88	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5		32.5		34.5	
Wheeling-15	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0						
Wheatland-89	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5						
Youngstown-6	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
EXTRA STRONG, PLAIN ENDS																				
Sparrows Pt.-3	33.5	13.0	37.5	17.0	39.5	20.5	40.0	21.0	40.5	22.0	41.0	22.5	41.5	23.0						
Cleveland-4	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0						
Oakland-19	24.5	4.0	28.5	8.0	30.5	11.5	31.0	12.0	31.5	13.0	32.0	13.5	32.5	14.0						
Pittsburgh-5	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.0	7.5	33.0	12.0	36.5	15.5
Pittsburgh-10	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0	36.5	17.5
St. Louis-32	34.5	14.0	38.5	18.0	40.5	21.5	41.0	22.0	41.5	23.0	42.0	23.5	42.5	24.0						
Sharon-90	35.5	14.0	39.5	18.0	41.5	21.0	42.0	21.5	42.5	22.0	43.0	22.5	43.5	23.0						
Pittsburgh-88	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0		33.0		36.5	
Wheeling-15	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0						
Wheatland-89	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5						
Youngstown-6	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	26.0	29.0	10.0	33.0	14.0	36.5	17.5

Galvanized discounts based on zinc at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢.

Threads only, buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3½ pts. higher discount. Buttweld jobbers' discount, 5 pct.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Axles	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer-1	3.60	4.00	4.70					
Chicago-4				6.15				
Ensley-11	3.60	4.00						
Fairfield-11		4.00	4.40			8.80	4.50	
Gary-1	3.60	4.00					4.50	
Ind. Harbor-8	3.60		4.70	6.15	5.60	8.80	4.50	
Johnstown-3		4.00			5.60	8.80		
Joliet-1		4.00	4.70					
Kansas City-83				6.40				9.85
Lackawanna-3	3.60	4.00	4.70			8.80	4.50	
Lebanon-3				6.15				9.85
Minnequa-14	3.60	4.50	4.70	6.15		8.80	4.50	9.85
Pittsburgh-77						9.35		9.85
Pittsburgh-78								9.85
Pittsburgh-5				6.15				
Pittsburgh-24							4.65	
Seattle-62				6.65			4.65	
Steelton-3	3.60		4.70				4.50	
Struthers-6				6.15				
Torrance-24							4.65	
Youngstown-4				6.15				

BOILER TUBES

$ Per 100 ft., cut, 10 to 24 ft.

F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	22.87	26.66	21.99	25.88
	2½	12	30.48	35.84	29.57	34.78
	3	*12	33.90	39.90	32.89	38.70
	3½	11	42.37	49.89	41.10	48.39
	4	10	52.60	61.88	51.03	60.02
National Tube	2	13	21.62	26.48		
	2½	12	29.65	36.32		
	3	12	34.00	41.64		
	3½	11	40.34	49.41		
	4	10	51.21	62.72		
Pittsburgh Steel	2	13		27.08		
	2½	12	30.49	37.15		
	3	12	34.95	42.59		
	3½	11	41.48	50.54		
	4	10	52.65	64.16		

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF_2 content:
70% or more $43.00
60% or less 40.00

WAREHOUSES

Base price, f.o.b., dollars per 100 lb. *(Metropolitan area delivery add 20¢ except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul, add 15¢; Memphis, add 10¢; Philadelphia, add 25¢; New York, add 30¢).

City	Sheets			Strip		Plates	Shapes	Bars		Alloy Bars			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4615 As rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As rolled	Cold-Drawn A 4140 Annealed
Baltimore	5.60	6.84	7.49[2]–8.07	6.04	.....	5.80	6.14	6.04	6.84–6.89	10.24	10.54	11.89	12.19
Birmingham*	5.60	6.40	6.75	5.55	.....	5.95	5.70	5.55	.....	.....	.....	.....	.....
Boston	6.20	7.00–7.25	7.74–8.29	6.15	8.50[4]	6.48–6.78	6.20	6.05	6.75–6.84	10.25	10.55	11.90–12.00	12.20–12.30
Buffalo	5.60	6.40	7.74–8.09	5.86	.....	6.05	5.80	5.60	6.40–6.45	10.15–10.85	10.45	11.80	11.95–12.10
Chicago	5.60	6.40	7.75	5.55	.....	5.80	5.70	5.55	6.30	9.80	10.10	11.45	11.75
Cincinnati*	5.87	6.44	7.39	5.80	.....	6.19	6.09	5.80	6.61	10.15	10.45	11.80	12.10
Cleveland	5.60	6.40	8.10	5.69	6.90	5.92	5.82	5.57	6.40	9.91	10.21	11.56	11.86
Detroit	5.78	6.53	7.89	5.94	.....	5.99	6.09	5.84	6.56	10.71	10.41	11.76	12.06
Houston	7.00	8.25	.....	.....	.....	6.85	6.50	6.65	9.35	10.35	11.25	.....	12.75
Indianapolis, del'd	6.00	6.80	8.15	5.95	.....	6.20	6.10	5.95	6.80	.....	.....	.....	.....
Kansas City	6.00	6.80	7.45	6.15	7.50	6.40	6.30	6.15	7.00	10.40	10.70	12.05	12.35
Los Angeles	6.35	7.90	8.85	6.40	9.45[6]	6.40	6.35	6.35	8.20	11.30	11.30	13.20	13.50
Memphis*	6.33–6.38	7.06–7.16	.....	6.33–6.38	.....	6.43–8.02	6.33–6.48	6.06–6.33	7.16–7.32	.....	.....	.....	.....
Milwaukee	5.74	6.54	7.89	5.69–6.59	.....	5.94	5.84	5.69	6.44–6.54	9.94	10.24	11.59	11.89
New Orleans*	5.70	6.59	.....	5.75	7.25	5.95	5.75	5.75	7.30	.....	.....	.....	.....
New York*	5.67–5.97	7.19[5]–7.24[1]	8.14[2]	6.29–6.89	8.63[4]	6.28–6.58	6.10	6.12	6.99	10.05–10.15	10.35–10.45	11.70–11.80	12.10–12.20
Norfolk	6.50[3]	.....	.....	.....	.....	6.50[3]	6.60[3]	6.55[3]	.....	.....	.....	.....	.....
Philadelphia*	5.90	6.80	8.00	6.10	.....	6.05	5.90	6.05	6.86	9.90	10.20	.....	.....
Pittsburgh	5.60	6.40	7.75	5.65–5.95	.....	5.75	5.70	5.55	6.15	9.80	10.10	11.45	11.75
Portland	6.60–7.55	8.95	8.50–9.10	7.30	.....	6.80	6.95	6.90	.....	.....	12.15	.....	.....
Salt Lake City	7.95	.....	9.70–10.50[2]	8.70–8.75	.....	8.05	6.75–8.30	7.95–8.65	9.00	.....	.....	.....	.....
San Francisco*	6.65	8.05[2]	8.55–8.90[2]	6.60	9.05[6]	6.50	6.45	6.45	8.20	11.30	11.30	13.20	13.20–13.50
Seattle	7.05	8.60	9.20	9.05	.....	6.75	6.65	6.75	9.05	.....	.....	.....	.....
St. Louis	5.80–5.85	6.65	8.00	5.80	6.00[4]–8.28	6.13	6.03	5.80	6.55–6.65	10.05	10.35	11.70	12.00
St. Paul*	6.16	6.96	8.31	6.11	.....	6.38	6.26	6.11	6.96	10.36	10.66	12.01	12.31

BASE QUANTITIES (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.
EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 400 to 1999 lb; (4) 6000 lb and over; (5) 1500 to 9999 lb; (6) 2000 to 5999 lb.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Blast Furnace Silvery	Low Phos. Charcoal
Bethlehem-3	54.00	54.50	55.00	55.50	.....	.....	.....
Birmingham-4	48.38	48.88	.....	.....	.....	.....	.....
Birmingham-91	48.38	48.88	.....	.....	.....	.....	.....
Birmingham-92	48.38	48.88	.....	.....	.....	.....	.....
Buffalo-4	52.00	52.50	53.00	.....	.....	.....	.....
Buffalo-93	52.00	52.50	53.00	.....	.....	63.75	.....
Chicago-94	52.00	52.50	52.50	53.00	.....	.....	.....
Cleveland-2	52.00	52.50	52.50	53.00	57.00	.....	.....
Cleveland-4	52.00	52.50	52.50	.....	.....	.....	.....
Daingerfield, Tex.-95	48.00	48.50	48.50	.....	.....	.....	.....
Duluth-94	52.00	52.50	52.50	53.00	.....	.....	.....
Erie-94	52.00	52.50	52.50	53.00	.....	.....	.....
Everett, Mass.-96	.....	55.25	55.75	.....	.....	.....	.....
Fontana-19	58.00	58.50	.....	.....	.....	.....	.....
Geneva, Utah-16	52.00	52.50	52.50	53.00	.....	.....	.....
Granite City, Ill.-102	53.90	54.40	54.90	.....	.....	.....	.....
Hubbard, Ohio-6	52.00	52.50	52.50	.....	.....	.....	.....
Ironton, Utah-16	52.00	52.50	.....	.....	.....	.....	.....
Jackson, Ohio-97, 98	.....	.....	.....	.....	.....	62.50	.....
Lyle, Tenn.-101	.....	.....	.....	.....	.....	.....	66.00
Monessen-18	54.00	.....	.....	.....	.....	.....	.....
Neville Island-99	52.00	52.50	52.50	53.00	.....	.....	.....
Pittsburgh-1	52.00	.....	.....	53.00	.....	.....	.....
Sharpsville-100	52.00	52.50	52.50	53.00	.....	.....	.....
Steelton-3	54.00	54.50	55.00	55.50	60.00	.....	.....
Swedeland-26	56.00	56.50	57.00	57.50	.....	.....	.....
Toledo-94	52.00	52.50	52.50	53.00	.....	.....	.....
Troy, N. Y.-4	54.00	54.50	55.00	.....	60.00	.....	.....
Youngstown-6	52.00	52.50	52.50	53.00	.....	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct, except low phos. 1.75 to 2.00 pct). 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 p t nickel. Subtract 38¢ per ton for phosphorus, content 0.70 pct and over. Silvery Iron: Add $1.50 per ton for each 0.50 per silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

REFRACTORIES

Fire Clay Brick *(F.o.b. works) Carloads, Per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5)	$94.60
No. 1 Ohio	88.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	88.00
No. 2 Ohio	79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$94.60
Childs, Pa.	99.00
Hays, Pa.	100.10
Chicago District	104.50
Western Utah and Calif.	111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago	111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	16.50
Silica cement, net ton, bulk, Hays, Pa.	18.70
Silica cement, net ton, bulk, Ensley, Ala.	17.60
Silica cement, net ton, bulk, Chicago District	17.60
Silica cement, net ton, bulk, Utah and Calif.	24.70

Chrome Brick *Per Net Ton*

Standard chemically bonded, Balt., Chester	$82.00

Magnesite Brick

Standard, Baltimore	$104.00
Chemically bonded, Baltimore	93.00

Grain Magnesite *St. ¾-in. grains*

Domestic, f.o.b. Baltimore, in bulk fines removed	$62.70
Domestic, f.o.b. Chewelah, Wash., in bulk	36.30
in sacks	41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢	$13.00

COKE

	Net Ton
Furnace, beehive (f.o.b. oven) Connellsville, Pa.	$14.50 to $15.00
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$17.50 to $18.00
Foundry, oven coke	
Buffalo, del'd	$26.69
Chicago, f.o.b.	23.00
Detroit, f.o.b.	24.00
New England, del'd	24.80
Seaboard, N. J., f.o.b.	22.75
Philadelphia, f.o.b.	22.70
Swedeland, Pa., f.o.b.	22.60
Painesville, Ohio, f.o.b.	24.00
Erie, Pa., f.o.b.	23.50
Cleveland, del'd	25.72
Cincinnati, del'd	25.06
St. Paul, f.o.b.	22.50
St. Louis	25.40
Birmingham, del'd	21.69
Neville Island	23.00

LAKE SUPERIOR ORES

(51.50% *Fe; natural content, delivered lower lake ports*) *Per gross ton*

Old range, bessemer	$8.70
Old range, nonbessemer	8.55
Mesabi, bessemer	8.45
Mesabi, nonbessemer	8.30
High phosphorus	8.30

After adjustments for analyses, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

C-R SPRING STEEL

F.o.b. Mill Cents Per Lb.	CARBON CONTENT				
	0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bridgeport, Conn.-58	5.35	6.80	7.40	9.35	11.65
Carnegie, Pa.-41	.....	6.80	7.40	9.35	11.65
Cleveland-2	4.65	6.45	7.40	9.35	11.65
Detroit-68	5.60	6.65	7.25	.....	.....
New Castle, Pa.-40	5.35	6.80	7.40	9.35	.....
New Haven, Conn.-68	5.85	6.75	7.35	.....	.....
Sharon, Pa.-13	5.35	6.80	7.40	9.35	11.65
Weirton, W. Va.-9	5.35	6.80	7.40	9.35	11.65
Worcester, Mass.-2	4.95	6.75	7.70	9.85	11.65
Youngstown-48	.....	6.80	7.40	9.35	11.65

GREATER *Flexibility*

A Big Advantage of

JOHNSON BAND SAWS

The adaptability and flexibility of Johnson Band Saws in handling all types of cutting is almost unlimited. Rods, tubes, angles, heavy rounds or flats and irregular shapes all can be cut quickly and economically . . . Model B Saw, pictured, offers the high speed and accuracy of a much larger machine. Capacity, 5" rounds and 10" flats; makes a handy saw for large or small shops; with or without casters. Also, Model J, for 10" rounds, 18" flats.

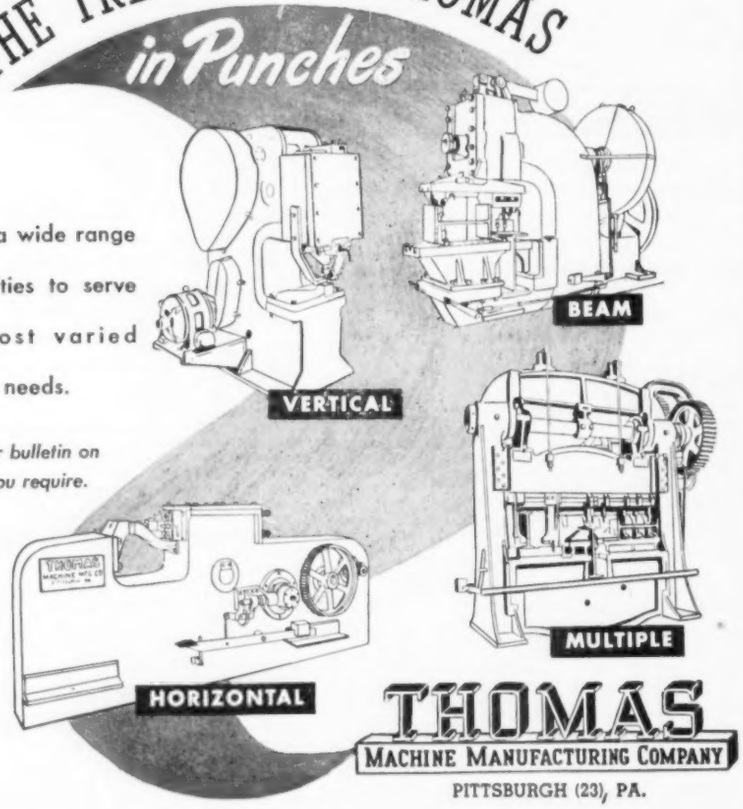
Write for catalog.

JOHNSON MANUFACTURING CORP.
ALBION, MICHIGAN

THE TREND IS TO THOMAS *in Punches*

Made in a wide range of capacities to serve your most varied punching needs.

Send for bulletin on type you require.



THOMAS
MACHINE MANUFACTURING COMPANY
PITTSBURGH (23), PA.

24

PUNCHES • SHEARS • PRESSES • BENDERS • SPACING TABLES

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	15	28½
9/16 in. & ⅝ in. x 6 in. & shorter	18½	30½
¾ in. & larger x 6 in. & shorter	17½	29½
All diam. longer than 6 in.	14	27½
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	34	....

Nuts, Hot Pressed, Cold Punched—Sq

	Pct Off List Less Keg (Reg.)	K.	Less Keg (Hvy.)	K.
½ in. & smaller.	15	28½	15	28½
9/16. in. & ⅝ in..	12	25	6½	21
¾ in. to 1½ in. inclusive	9	23	1	16½
1⅝ in. & larger.	7½	22	1	16½

Nuts, Hot Pressed—Hexagon

½ in. & smaller.	26	37	22	34
9/16 in. & ⅝ in..	16½	29½	6½	21
¾ in. to 1½ in. inclusive	12	25	2	17½
1⅝ in. & larger.	8½	23	2	17½

Nuts, Cold Punched—Hexagon

½ in. & smaller.	26	37	22	34
9/16 in. & ⅝ in..	23	35	17½	30½
¾ in. to 1½ in. inclusive	19½	31½	13	25
1⅝ in. & larger.	12	25	6½	21

Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
½ in. & smaller.	35	45	28½	39½
9/16 in. & ⅝ in..	29½	40½	22	34
¾ in. to 1½ in. inclusive	24	36	15	28½
1⅝ in. & larger.	13	26	8½	23

	Light	
7/16 in. & smaller	35	45
½ in. thru ⅝ in.	28½	39½
¾ in. to 1½ in. inclusive	26	37

Stove Bolts *Pct Off List*

Packaged, steel, plain finished 48—10
Packaged, plated finish ..... 31—10
Bulk, plain finish** 62*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets *Base per 100 lb*

½ in. & larger..... $7.85

Pct Off List

7/16 in. & smaller..... 50

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.

Cap and Set Screws

(In bulk) *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright..... 64
⅝ in. thru 1 in. up to & including 6 in. 60
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat..... 60
⅝ in. thru 1 in. up to & including 6 in. 57
Milled studs 30
Flat head cap screws, listed sizes.... 10
Fillister head cap, listed sizes..... 54
Set screws, sq head, cup point, 1 in. diam and smaller x 6 in. & shorter 53

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

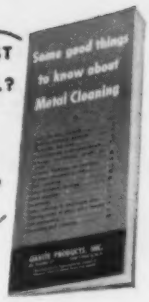
High carbon type: 60-65% Cr, 4-8% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.55

WHAT'S THE FASTEST WAY TO CLEAN METAL?
See page 11
WHAT'S THE MOST ECONOMICAL WAY?
See page 9



This FREE booklet on Metal Cleaning helps you get better production, larger profits. Among its subjects are:

Machine cleaning	Tank cleaning
Electrocleaning	Pickling
Pre-paint treatment	Burnishing
Steam-gun cleaning	Rust prevention

FREE Write Oakite Products, Inc., 30H Thames St., New York 6, N. Y., for the 44-page booklet: *"Some good things to know about Metal Cleaning."*

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WHAT'S THE BEST WAY TO STRIP PAINT FROM METAL PARTS TOO LARGE TO BE SOAKED IN TANKS?
See page 3

This FREE booklet on Paint Stripping helps you plan better procedures. Read more about:

¶How to strip large areas of structural metal? *See page 5.*

¶How to strip metal parts in large volume? *See page 9.*

¶How to strip oil-base paints? synthetic enamels? lacquers? alkyds? phenolics? ureas? *See page 12.*

FREE Write Oakite Products, Inc., 30H Thames St., New York 6, N. Y., for this 14-page booklet: *"How to Strip Paint."*

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Technical Service Representatives Located in Principal Cities of United States and Canada

ELECTRODES

Cents per lb., f.o.b. plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
	GRAPHITE	
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2½	24, 30	23.15
2	24, 30	25.36
	CARBON	
40	100, 110	8.03
35	65, 110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
20	84, 90	8.03
17	60, 72	8.03
14	60, 72	8.57
10, 12	60	8.84
8	60	9.10

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. (21)	*29.5	
Washgtn, Pa. (39)	*29.5	
Claymont, Del. (29)	*28.00	
Conshohocken, Pa. (26)		*27.50
New Castle, Ind. (55)	*26.50	*25.50
Nickel-carbon		
10 pct Coatesville (21)	32.5	
Inconel-carbon		
10 pct Coatesville (21)	40.5	
Monel-carbon		
10 pct Coatesville (21)	33.5	
No. 302 Stainless-copper stainless, Carnegie, Pa. (60)		77.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

*Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.505
18	4	1	—	5	$1.63
18	4	2	—	—	$1.65
1.5	4	1.5	8	—	81.0¢
6	4	2	6	—	96.5¢

High-carbon chromium	63.5¢
Oil hardened manganese	35¢
Special carbon	32.5¢
Extra carbon	27¢
Regular carbon	23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.4¢ to 9.0¢
Canadian sponge iron, del'd In East	10.00¢
Domestic sponge iron, 98+% Fe, carload lots	15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+% Fe	42.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	53.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe	83.0¢ to $1.48
Aluminum	31.5¢
Brass, 10 ton lots	30.00¢ to 33.25¢
Copper, electrolytic	10.75¢ plus metal value
Copper, reduced	10.00¢ plus metal value
Cadmium, 100-199 lb.	95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity, del'd	$3.50
Lead	7.5¢ to 12.0¢ plus metal value
Manganese	57.0¢
Molybdenum, 99%	$2.75
Nickel, unannealed	88.0¢
Nickel, annealed	95.0¢
Nickel, spherical, unannealed	92.0¢
Silicon	38.5¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	83.00¢
Stainless steel, 316	$1.10
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$6.00
Zinc, 10 ton lots	23.0¢ to 30.5¢

don't scrap metal by turning!

...save by Swaging on TORRINGTON SWAGERS

The Torrington Rotary Swaging Machine uses every bit of stock. With 4000 hammer blows a minute, swaging reduces, sizes, rounds, tapers and points rod, wire and tubing. It makes metal tougher and more resilient. It hammers away minor surface defects.

Torrington Swagers are built to a mechanical perfection based on our 42 years' swaging experience. Send today for your free copy of the illustrated booklet describing the machine and the method.

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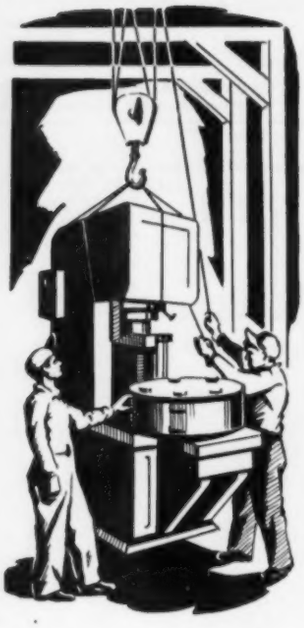
When **PRODUCTION**

hangs by a "Thread"...



specify the wire rope that gives the greatest service. "HERCULES" (Red-Strand) *Preformed* spools more evenly—bends more smoothly. Handles more safely. Splices more easily. Far fewer replacements are needed.

Engineered to reduce internal tension and twisting, "HERCULES" (Red-Strand) *Preformed* stays on the job—*in* the groove.

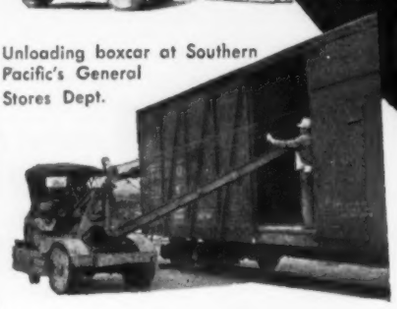
For uninterrupted production, there is only one right rope . . . be sure to select the correct size and type.

LESCHEN WIRE ROPE

Feel free to consult our Engineering Department at any time for specific recommendations. A. LESCHEN & SONS ROPE CO., 5909 Kennerly Ave., St. Louis, Missouri. Warehouses and branch offices in all principal cities.

Heavy Industries Use KRANE KAR SWING-BOOM MOBILE CRANE to Cut Costs by Handling Loads Easier, Faster, Safer

Stacking fittings at a Los Angeles Public Utility



Unloading boxcar at Southern Pacific's General Stores Dept.

Handles tubes and heavy equipment at the Wilmington Refinery of the Union Oil Company

Gas or diesel, 12 to 37 ft. booms, or adjustable telescopic booms; solid or pneumatic rubber-tires. 1½, 2½, 5, and 10 ton cap. Buckets, magnets, all-weather or foldable tops, and other accessories available.

WRITE FOR BULLETIN NO. 79

SILENT HOIST & CRANE CO. 851 63rd ST., BROOKLYN 20, N.Y.

ELECTRICAL SHEETS

22 Ga. H-R cut lengths

F.o.b. Mill Cents Per Lb.	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech-Bottom-15		7.25	8.50	9.30	9.85	10.40	11.10
Brackenridge-28		7.25	8.50	9.30	9.85		
Follansbee-63	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Granity City-22		7.95	9.20				
Ind. Harbor-3	6.75	7.25					
Mansfield-75	7.25	7.75	9.00	9.80			
Niles, O.-64	7.05	7.55					
Vandergrift-1	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Warren, O.-4	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Zanesville-7	6.75	7.25	8.50	9.30	9.85	10.40	11.10

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si.)

0.06% C	30.50	0.20% C	29.50
0.10% C	30.00	0.50% C	29.25
0.15% C	29.75	1.00% C	29.00
2.00% C			28.75
65-69% Cr, 4-9% C			22.00
62-66% Cr, 4-6% C, 6-9% Si.			22.00

Foundry Ferrochrome

Contract prices, cents per lb of alloy. Noncontract prices add 2.50¢ per lb.

High carbon 8 Mesh and down.

62 to 66% Cr, 5 to 7% C, 7 to 10% Si.

Carloads, bulk	23.25
Carloads, packed	24.25
Ton lots, packed	27.25

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.10% max. C.	$1.14
0.50% max. C.	1.10
9 to 11% C.	1.08

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.00¢ per lb of contained Si.

Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.20¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.50
Less ton lots	23.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50¢
Less ton lots	17.75¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.00¢
Ton lots to carload packed	19.00¢
Less ton lots	20.50¢

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

size for size

THE MOST POWERFUL, EFFICIENT AIR TOOLS EVER BUILT!

THE *NEW* BUCKEYE "A" Series AIR TOOLS

274 models...single direction and reversible

79% of parts completely interchangeable

Fully adjustable speed control

More power developed per c.f.m.

TYPES	CAPACITIES
Drills	to ¼"
Screwdrivers	to #10 screws
Nutrunners	to ¼"
Grinders	to 1½" wheel
Shears	to 18 ga.

Buckeye Tools CORPORATION

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Portable Air and Electric tools for Industry

IN CANADA: Joy Manufacturing Co. (Canada) Ltd., Galt, Ontario

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JAN-B-121, Types I and II
Grade A, Class 1

JAN-P-131, Amendment 3, Type I
Classes A and B

AN-B-20, Type II
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Consult us on your needs for flexible packaging, either with government-approved materials or engineered to your specific requirements.

*Trade Mark

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The thousands of purchasing executives, production chiefs, and engineers, all potential BUYERS of your products are among the readers of Iron Age. Your advertisement here can pave the way for your salesmen throughout the metalworking industry.

For information write:

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FERROALLOYS

Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.

F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont., Ashtabula, O.	$185
F.o.b. Johnstown, Pa.	$187
F.o.b. Sheridan, Pa.	$187
F.o.b. Etna, Clairton, Pa.	$185

$2.00 for each 1% above 82% Mn. penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.95
Ton lots	12.55

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$74.00	$75.00
Pgh. or Chicago	75.00	76.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	34.75
Ton lots	36.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn ..... 19.15¢

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	9.50
Ton lots	11.55
Briquet, contract basis carlots, bulk delivered, per lb of briquet	11.15
Ton lots	12.75

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $90.00. **Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.**

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	21.70
97% Si, 1% Fe	22.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carload, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90-95% Si			17.50

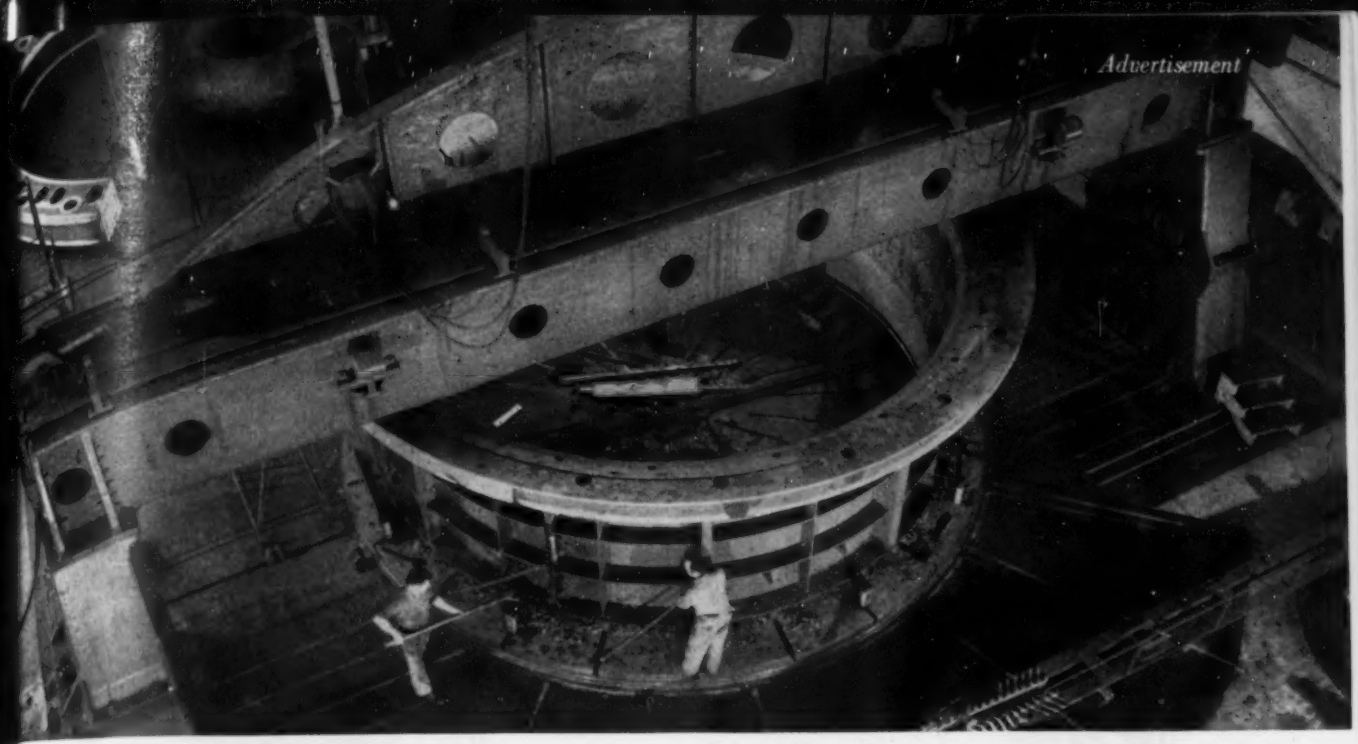
Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd, Mn 85-90%.

	Carloads	Ton	Less
0.7% max. C, 0.06% P, 90% Mn	26.25	28.10	29.30
0.07% max. C	25.75	27.60	28.80
0.15% max. C	25.25	27.10	28.30
0.30% max. C	24.75	26.60	27.80
0.50% max. C	24.25	26.10	27.30
0.75% max. C, 7.00% max. Si	21.25	23.10	24.30

For other ferroalloys see May 24 issue, p. 160.

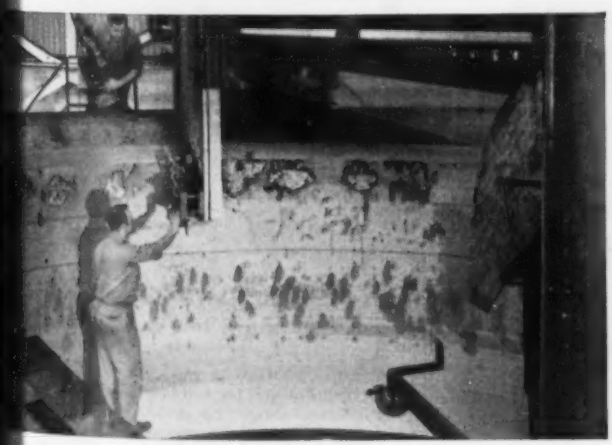
Advertisement



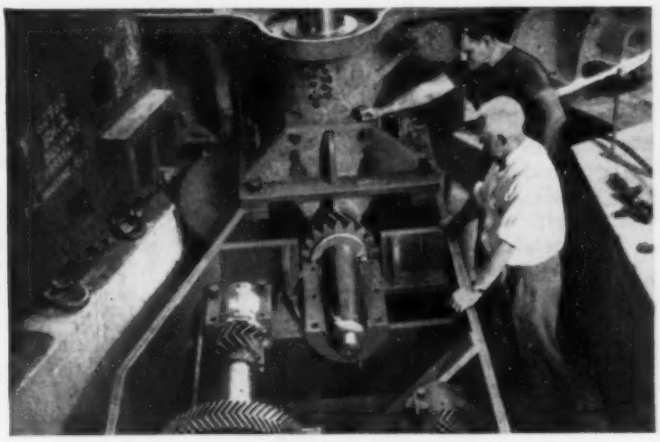
$400,000 VERTICAL BORING MILL, one of the world's largest, bores, turns and faces hydraulic turbine parts. Sunoco Way Lubricant, approved by 39 machine tool builders, was selected by the design engineers to prevent stick-slip with resultant scoring of ways and slides. Even under the weight of work as heavy as 75 tons, Sunoco Way Lubricant has never squeezed out.

TURBINE PARTS 62 FEET IN DIAMETER MACHINED BY HUGE VERTICAL BORING MILL

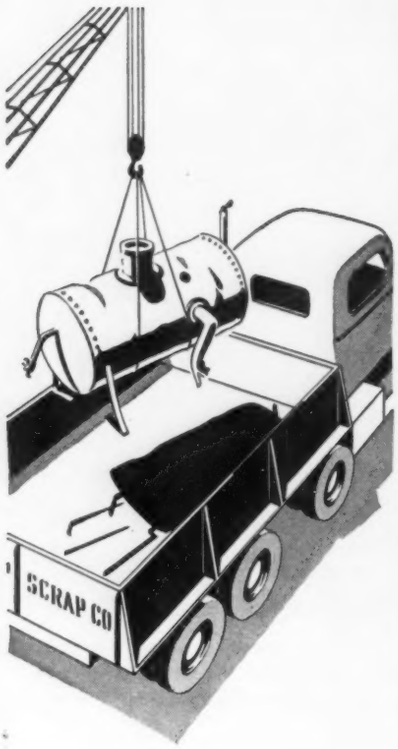
This mill was installed eight months ago by S. Morgan Smith, well-known hydraulic turbine manufacturer. Without alterations, it can take work up to 22 feet high with a maximum swing of 42 feet between housings. By removing the housings and adding a head to the face plate, it can be modified to handle parts 62 feet in diameter. Sunoco Way Lubricant, specified for the ways and rails by the design engineers, has been used exclusively. The mill accommodates work that weighs as much as 75 tons. No jump or stick-slip has ever marred a finish or impaired accuracy. The ways and rails remain like new. This is typical of the performance that has won the endorsement of 39 machine tool builders for Sunoco Way Lubricant. For an informative booklet and sample, write on your business letterhead to Sun Oil Company, Department IX-8, Phila. 3, Pa.



ELECTRONICALLY CONTROLLED CUTTING TOOLS machine a turbine discharge ring 9' high, 27' 8" dia., 21' 8" bore. Sunoco Way Lubricant keeps rails free of rust and corrosion. Starting up after week-end shutdowns, tables and other parts move freely on the ways and slides without jump or stick-slip.



THE SYNCHRONOUS GEAR DRIVE, controlling table speeds from .094 to 6.045 rpm., is pressure-fed with another Sun "Job Proved" product—Sunep. This extreme pressure lubricant is exceptionally stable, minimizes wear, gives long-time protection to very heavily loaded teeth in many types of gear boxes.



QUICK WAY TO MAKE *ASSETS* OUT OF "CLUNKERS"

Scrap your obsolete and inefficient tools, dies and machinery . . . make worn-out equipment pay part of the cost of new machines . . . scrap prices are high today.

Your old, idle equipment will help ease the steel shortage too . . . every ton of scrap machinery helps make about 2 tons of new, vital steel.

Start today to turn your idle scrap into money . . . and steel . . . a memo to your production foremen will uncover truckloads of idle machine scrap and production scrap . . . a phone call to your scrap-metal dealer will start this much-needed metal on its way to the mills to make more steel . . . help ease the steel shortage.

REPUBLIC STEEL

REPUBLIC STEEL CORPORATION
General Offices • Cleveland 1, Ohio

Other Ferroalloys

Alsifer, 20%, Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
Carload ..... 9.90¢
Ton lots ..... 11.30¢

Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo. $1.15

Ferrocolumbium, 50-60%, 2 in. x D, contract basis, delivered, per pound contained Cb.
Ton lots $4.90
Less ton lots 4.95

Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $3.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo. $1.32

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
10 tons to less carload 75.00

Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa. freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots 1.55

Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $177.00

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered $5.00

Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.
Openhearth ..... $3.00-$3.10
Crucible 3.10- 3.20
High speed steel (Primos) 3.20- 3.25

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b Langeloth, Pa. $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
Carload, bulk lump ..... 14.50¢
Ton lots, bulk lump ..... 15.75¢
Less ton lots, lump ..... 16.25¢

Vanadium pentoxide, 86 to 89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.2[illegible]

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
Ton lots ..... 21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
Carload, bulk ..... 7.00¢

Boron Agents

Contract prices per lb of alloy, del.

Borosil, f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B $5.25

Bortam, f.o.b. Niagara Falls
Ton lots, per pound ..... 45¢
Less ton lots, per pound ..... 50¢

Carbortam, Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
Ton lots, per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots $1.20
F.o.b. Wash., Pa.; 100 lb up
10 to 14% B ..... .85
14 to 19% B 1.20
19% min. B 1.50

Grainal, f.o.b Bridgeville, Pa., freight allowed, 100 lb and over.
No. 1 ..... $1.00
No. 6 ..... 68¢
No. 79 ..... 50¢

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
Ton lots $1.46
Less ton lots 1.57

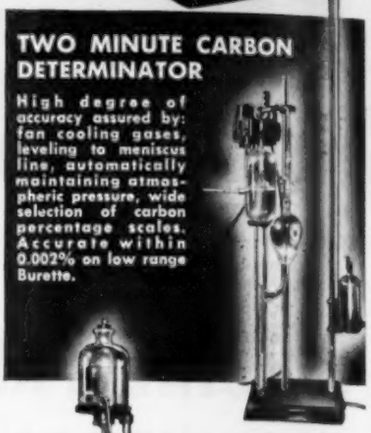
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.
Less ton lots $1.80

Silcaz, contract basis, delivered.
Ton lots ..... 45.00¢

CARBON and SULFUR ANALYSIS with *Speed! Ease! Accuracy!*

TWO MINUTE CARBON DETERMINATOR

High degree of accuracy assured by: fan cooling gases, leveling to meniscus line, automatically maintaining atmospheric pressure, wide selection of carbon percentage scales. Accurate within 0.002% on low range Burette.



THREE MINUTE SULFUR DETERMINATOR

Determination in accordance with A.S.T.M. specification accuracy within 0.002% inorganic or organic materials. Simple procedure.

HIGH-TEMPERATURE FURNACE

Sturdy construction with HIGHEST QUALITY insulation.

Use 3031D Boats and Zircotubes to reduce operating cost of analysis.

Use Dietert-Detroit Carbon and Sulfur Determinators for Economical Analyses
Write to Dept. S-1 for descriptive literature

CONTROL EQUIPMENT
HARRY W. DIETERT COMPANY
9330 ROSELAWN • DETROIT 4, MICH.

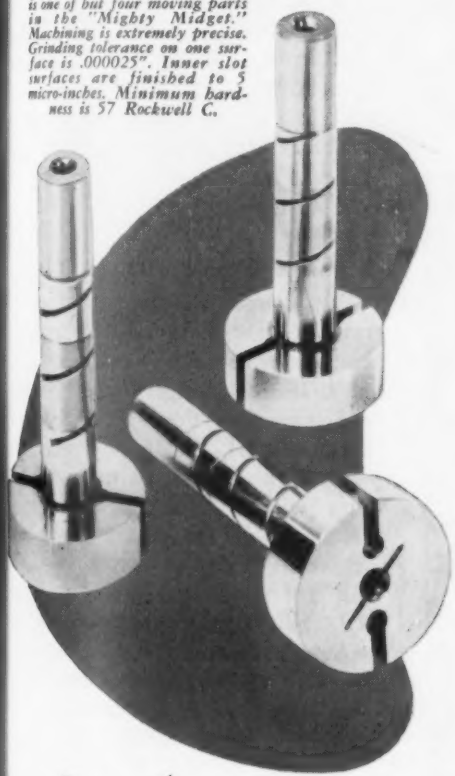
Republic Metallurgical Service

gives more might to Seeger's

"Mighty Midget"

Scrap losses down from 25% to under 0.1%! . . . Full inspection for hardening replaced by a simple spot check! . . . Rehardening trimmed from 30% to zero! . . . Distortion troubles straightened out! . . . Several finish grindings eliminated! . . . These are some of the tangible results Seeger Refrigerator Company "put on ice" in cooperation with Republic Metallurgical Service.

This alloy steel compressor rotor is one of but four moving parts in the "Mighty Midget." Machining is extremely precise. Grinding tolerance on one surface is .000025". Inner slot surfaces are finished to 5 micro-inches. Minimum hardness is 57 Rockwell C.



Seeger engineers and Republic Field Metallurgists studied the processing of the alloy steel rotor for the "Mighty Midget" —the efficient, compact compressor which powers Seeger domestic refrigerators and home freezers. Together they agreed on revised cold drawn alloy steel bar specifications and process modifications.

Then Republic's Union Drawn Steel Division, working to structure rather than hardness, modified its steel processing to achieve specific machinability requirements. For uniform heat treating results, a guaranteed hardenability alloy steel was recommended, with carbon correction advised for maximum wearing conditions. Heat treating equipment was adjusted.

The results: more might for the "Mighty Midget," plus substantial material and time savings. Time now to take a long look at your own products and processes? This same 3-Dimension Metallurgical Service is freely available to all alloy steel users. It's completely confidential and without obligation. Just write:

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

. . . combines the extensive experience and coordinated abilities of Republic's *Field, Mill* and *Laboratory* Metallurgists with the knowledge and skills of your own engineers. It has helped guide users of Alloy Steels in countless industries to the correct steel and its most efficient usage. IT CAN DO THE SAME FOR YOU.

Republic ALLOY STEELS

REPUBLIC STEEL

Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Plates, Pipe, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

ARMSTRONG *Drop Forged* EYE BOLTS

They'll Carry the Load

Specify ARMSTRONG Drop Forged Eye Bolts for extra strength — correctly engineered proportions, forged-in quality, uniformity of design in all sizes and the best mild steel, heat treated to increase tensile strength. Built to tool standards, not hammered out as "tonnage" forgings, they always carry their load safely.

Stocked by Armstrong distributors with or without shoulders, threaded or as blanks in 16 sizes (openings from ¾" to 4" i.d.).

Write for Catalog

ARMSTRONG BROS. TOOL CO.

5209 W. Armstrong Avenue — Chicago 30, U.S.A.

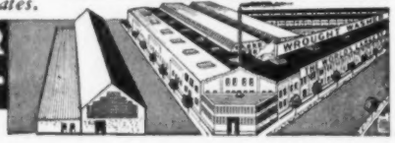
Eastern Warehouse and Sales: 199 Lafayette St., New York 12, N. Y.
Pacific Coast Whse. and Sales Office: 1275 Mission St., San Francisco, 3, Calif.

Since 1887

MILWAUKEE WROT WASHERS

***Better* WASHERS ... Competitively Priced**

Large volume production, the most advanced methods and facilities, plus more than 60 years of continuous experience in the manufacture of Washers, are factors that enable us to offer you top quality washers and stampings at competitive costs. Over 22,000 sets of dies for making Washers of every type (Standard and Special), from every type of material, for every purpose, in any finish. STAMPINGS of all descriptions; Blanking, Forming, Drawing. *Submit your blueprints and quantity requirements for estimates.*



WROUGHT WASHER MANUFACTURING CO.

The World's Largest Producer of Washers

2202 S. BAY ST., MILWAUKEE 7, WIS.

Trade Organization Lists Subcontractors in N.Y. Area

A complete description of metalworking plants, available for subcontracting, together with a listing of performance abilities, facilities, types of work that can be performed and the metals which employees are experienced in handling, is available from the Commerce and Industry Assn. of New York, Inc. This listing of firms in the New York area has grown during the last 4 months to over 1000.

According to Thomas Jefferson Miley, vice-president of the trade organization, the establishments registered include machine shops, metal stamping plants, tool and die shops, foundries, assembling plants and various welding shops.

Prime contractors interested in requesting information have been contacting the trade organization in ever increasing numbers. According to Mr. Miley nearly 1000 contracts have been let since the first of the year through the organization.

Seek More Materials for AE

Problems of increasing production of raw materials for atomic energy projects is being explored in closed hearings by a Senate subcommittee headed by Senator Anderson, D., N. M.

Manufacturers awarded new orders will be accorded the same privilege of requesting advances, according to present plans. GSA will get a recommendation from NPA before making an advance.

Authority to offer financial advances was contained in an early July directive from Defense Mobilizer Wilson to GSA.

New Wage Group to Report

On the basis of complaints received from tool and die employees throughout the country, the new Tool and Die Industry Study Committee, of the Wage Stabilization Board, will report to WSB on recommended changes to wage regulations applying to the tool and die industry.

H&G DIE HEADS

WITH INSERT CHASERS

FOR ALL MACHINES USED FOR CUTTING SCREW THREADS

The famous H & G Die Heads come in styles and sizes for all types of machines, including threading machines, chucking machines, drill presses, turret lathes, and automatic screw machines, such as Brown & Sharpe, Cleveland, Cone, Davenport, Economy, Foote-Burt, Greenlee, Gridley, Acme-Gridley, New Britain, New Britain-Gridley, Swiss, etc.

The small, inexpensive high-speed steel insert chasers are held by rugged carriers and cut threads straight and true to the close tolerances required.

The majority of expert production men prefer these die heads because of the ease with which insert chasers are resharpened and set, the low cost of insert chasers and the greater quantity of threads per grind and number of pieces threaded per chaser dollar.

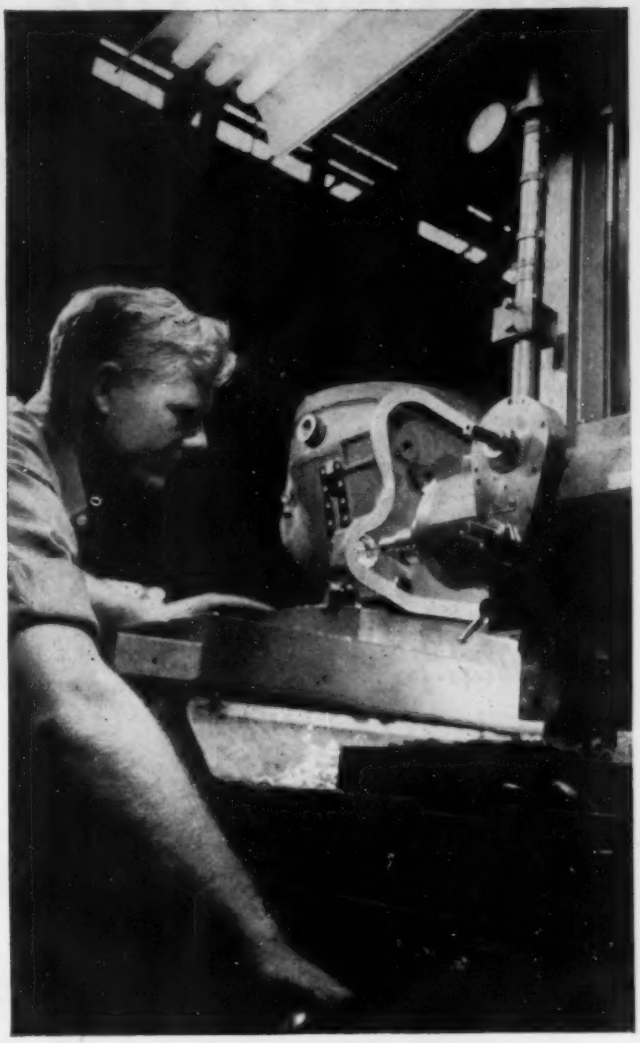
The reduction in inventory will pay for new die heads. **For example:** If you have $1,000 in chaser inventory, changing to H&G will require only $300, setting free $700 for the purchase of new H&G heads. This is due not only to low cost of chasers, but to interchangeability and long life.

Check and Mail for—☐ "Selecting Proper Die Head for the Job" Free Copy—☐ Style MM ☐ Style DMS ☐ Style DM ☐ Style TM

THE EASTERN MACHINE SCREW CORPORATION

21-41 BARCLAY STREET NEW HAVEN, CONN.

Mfrs. General Purpose Die Heads, Insert Chaser Die Heads, Threading Machines.



This picture* does not equal 10,000 words

This is a fine photograph—but men and machines are only part of the story at IGW. It takes esprit de corps (a much overworked term that fits here)—it takes pride of workmanship to produce fine precision gears and parts.

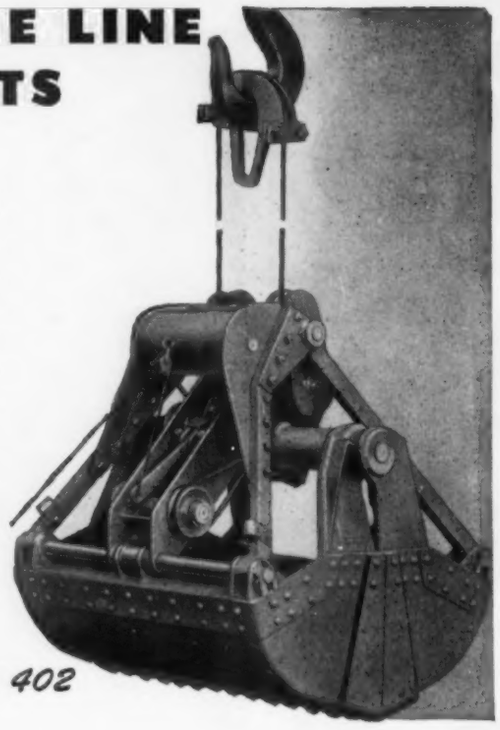
*** This Horizontal Jig Borer is typical of the high precision tools designed and built by Indiana Gear for their own use.**

Indiana GEARS

GEARS • CAMS • INTRICATE AND PRECISE MACHINE PARTS

INDIANA GEAR WORKS • INDIANAPOLIS 7, IND.

ERIE SINGLE LINE BUCKETS



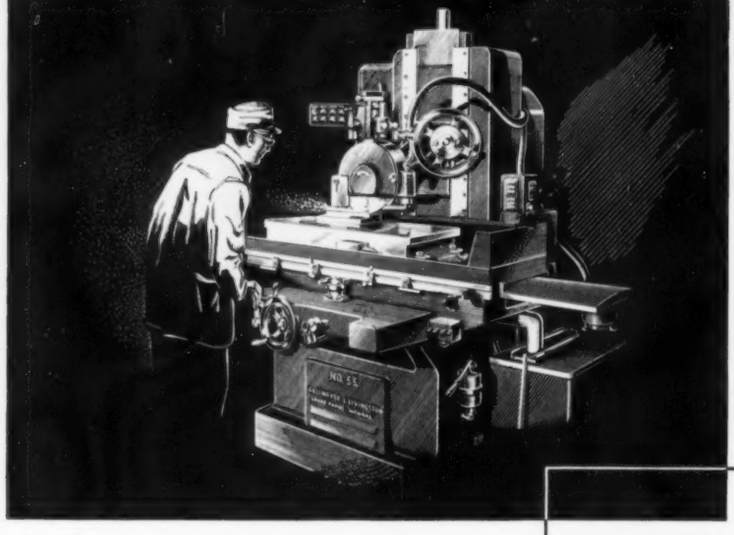
ILLUSTRATED is the hook-on type, for intermittent service. It is reeved and ready for operation on overhead traveling crane, monorail hoist, locomotive crane, derrick, ships tackle or any other hoisting device which has but a single hoisting drum available for bucket duty. Just slip the yoke over the crane hook.

Erie Single Line buckets are also available in the direct-reeved type for permanent installation. Describe your Single Line bucket need — we'll give you our recommendations for we build all types and sizes.

● *Write for Booklet 402*

ERIE
STEEL CONSTRUCTION COMPANY
818 GEIST ROAD • ERIE, PENNSYLVANIA

WHEN THE DECISION IS PRECISION...



Where extreme tolerances are not required, the choice of any particular grinding machine may not be too important. But, where absolute precision is demanded, the choice is usually *Grand Rapids.*

Defense orders make it impossible to fill orders as quickly as we desire—but we know our customers can appreciate the reasons for delay As always we'll do our best to serve you.

GALLMEYER & LIVINGSTON CO.
200 Straight Ave., Grand Rapids, Mich.

Grand Rapids Grinders
—World's finest

GALLMEYER & LIVINGSTON

Reorganize German Steel Industry

The combined steel group of the Allied High Commission, in Germany, has taken the first steps in the reorganization of the German iron and steel industry by the transfer of company assets to new company units.

It is expected that within the next 6 months, 24 or 28 companies will be formed. When the process is completed it is hoped that the occupying powers will have carried out their purpose to eliminate concentration of economic power, prevent development of war potential, and exclude from control those who furthered the "aggressive designs of the National Socialist Party."

Raw Materials Search Broadens

With available supplies of asbestos at the stage where some producers are filling only rated orders, assistance of NPA is being extended to Canada in the form of raw materials in hope of expanding production in that country. The aid is in the form of help in obtaining mining equipment.

Current domestic production is in the neighborhood of about 4,000,000 lb, NPA says, and Navy requirements over the next 6 months is about 20 pct of this figure or 800,000 lb.

Exploration work is likewise being conducted by DMA in northern California and southern Oregon, officials said. Indications are that reserves of high quality exist in this region.

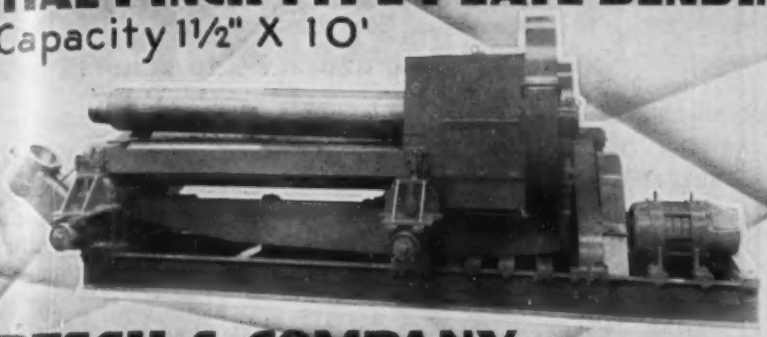
Employment Rises in New York

Manufacturing employment in New York State took the upswing. Total was 1,885,600 workers in mid-June. It was a gain of 15,600 over mid-May and of 135,100 over mid-June last year.

Upsurge of activity in metalworking plants was a major contribution to the increase. Durable goods showed a 1.2 pct gain during the month on a state-wide basis, while non-durable goods employment inched up only 0.6 pct.

INITIAL PINCH TYPE PLATE BENDING ROLL

Capacity 1½" X 10'



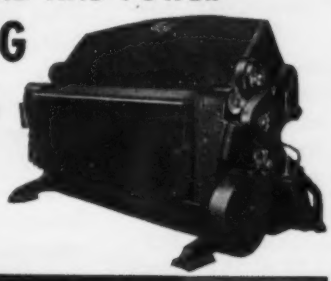
Our Line

Light and heavy machinery for all classes of sheet metal, plate and structural work

BERTSCH & COMPANY, CAMBRIDGE CITY • INDIANA

STEEL HAND AND POWER

CHICAGO **BENDING BRAKES**

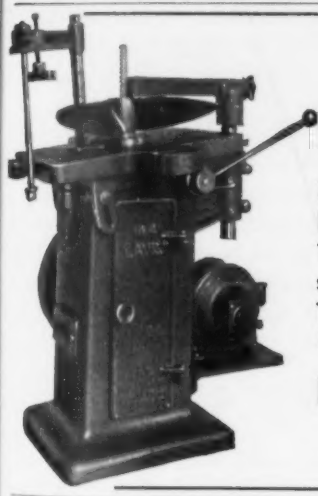


For Single and Quantity Runs Bending Steel Plate and Sheet Metal

Special Bending Brakes
Double Folder Brakes

DREIS & KRUMP MANUFACTURING COMPANY — CHICAGO

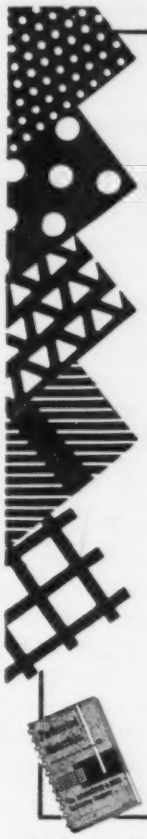
7430 S. Loomis Blvd., Chicago 36, Ill.



"DAVIS" KEYSEATER

Low in Cost. Durable. Easy to operate.
Table adjustable for straight or taper keyways.
Three sizes. Keyways 1/16" up to 1".

DAVIS KEYSEATER CO.
400 Exchange St.
Rochester 8, N. Y.



Investigate the Advantages of H & K PERFORATIONS

—for cleaning, grading, straining and filtering . . . guarding and ventilating . . . acoustical treatment . . . ornamental enclosure, and related problems of product and machine design.

You have a wide selection of patterns to choose from, all accurately perforated. For commercial processing, perforations may be had with as close as ± .0005". Materials include practically all metals and sheet materials such as plastics, fabrikoids, plywood, etc. Ornamental grilles may still be furnished in steel with painted finishes.

Perforated sheets may be furnished rolled, formed, sheared, welded, brazed or otherwise fabricated to your specifications.

Catalog No. 62 tells the "hole" story —write for it!

The Harrington & King Perforating Co

5657 Fillmore St., Chicago 44, Illinois
114 Liberty St., New York 6, N. Y.

WEBB WIRE

STRENGTH UNIFORMITY DURABILITY

NEEDLE and STAINLESS

THE WEBB WIRE WORKS
NEW BRUNSWICK, N. J.
PHONE 2-4668-9

WHO* looks more like a busy, little beaver than a wise, old owl these days. But WHO* is still—

Wm. H. Ottemiller* Co.
of YORK, PA.

Even though the need for our precision, "milled-from-the-bar" screw machine products has us virtually snowed under—we invite inquiries from those of you who must have "the best."

CONSIDER GOOD USED EQUIPMENT FIRST

AIR COMPRESSORS

2873 cu. ft. Worthington 29 x 21" & 18½ x 21". Complete with Elec. Equipment
1480 cu. ft. Worthington 23" & 14 x 16". With 300 H.P. Syn Motor 4160/3/60

BOLT THREADING MACHINE

⅞" Acme 2-Spindle—With Landis Head

CRANES—OVERHEAD ELECTRIC TRAVELING

10 ton Milwaukee 89'5" Span 220/3/60. With two 5 ton trolleys
10 ton Case 100' Span 220/3/60. With two 5 ton Trolleys

CRANE—ROUSTABOUT

Hughes Keenan Roustabout Crane Model MC-4 25' Gooseneck Boom, Mounted on Tractor. Equipped with pneumatic tires

CRANE—LOCOMOTIVE

Industrial Brownhoist Type B Steam Locomotive Crane, 50' Boom. New Boiler installed 1946

CRANE TROLLEY

50 ton P & H Trolley with 15 & 37 H.P. Motors 220 volt 3 phase 60 cycle

FLANGING MACHINE

No. 6 Blue Valley Flanging Machine, Motor Driven With 15 H.P. 220/440 Volt AC Motor. Capacity ⅝" material from 30" to 20' flat heads and ¾" material 6' diameter or larger dished heads

FORGING MACHINES

2" AJAX New Model Forging Machine Twin Gear Drive, Belted Motor Drive, With A.C. Motor and Starter, Overhung Suspended Header & Die Slides

LATHE—TURRET

Gisholt Model 2L Turret Lathe, Motor Driven 15" Dia. 3 Jaw Universal Chuck, 4" Hole in Spindle. NEW 1942 or Later.

PLANERS

48 x 48" x 18' Cincinnati, Four Head
48 x 48" x 12' Niles-Bement-Pond, Four Head
60 x 60" x 12' Niles-Bement-Pond, Four Head
120 x 72" x 19' Betts, Four Head

PLANER—OPEN SIDE

60 x 60" x 18' Detrick & Harvey Three Head

PRESS—HYDRAULIC FORGING

1500 ton Mesta Steam Hydraulic Forging Press Quick Acting. 48" Stroke, 8' x 3'6" Between Columns — Including Wellman Manipulator. Rotating Type

ROLLING MILL

23" x 60" Mackintosh Hemphill Three High Breakdown Mill, Cast Steel Housings, Motor Driven Screw Downs, Complete with Pinion Stand, etc.

SHEARS—BAR

No. 14EF Pels, Belted Motor Drive. Capacity 1¼" Round, 1⅛" Sq. 3 x 3 x ½" Angles
No. O Hilles & Jones Guillotine Type. Capacity 1½" Round, 1⅛" Sq. 2½ x 2½ x ¼" Angles

SHEAR—ROTARY

#40A Quickwork, ½" Capacity. Circle Cutting Attachment & Elec. Equip. Included

TESTING MACHINES

120,000 lb. SOUTHWARK-TATE-EMERY Universal Hydraulic Testing Machine. LATE
10,000# Olsen Universal Wire Testing Machine
50,000# Riehle Universal Testing Machine
200,000# Riehle Universal Testing Machine
300,000 lb. SOUTHWARK-EMERY Universal Hydraulic Testing Machine

WELDERS

700 KVA Federal Flash Welder, Enclosed Rim Type, 440 Volt, Single Phase, Ring Sizes 6" to 35" Diameter x 12" Wide
40 KVA Sciaky Spot Welder, 36" Throat 440/3/60 operation

RITTERBUSH & COMPANY INC.
50 Church Street, New York 8, N. Y.
Phone—Cort 7-3437

The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Get Out the Moxie—The dog days slowup in almost all used machinery centers continues. According to one used machine tool dealer, the field is once again slipping under the narcotic spell of having had inquiries come to it too easily. Now, he says, is the time for a little promotion—to give up front row seats before desk fans and go calling on old customers and potential customers.

It's time to take some of that old business "moxie" from storage and with a little sales logic point out to the small firms still waiting on the fringe of defense work for subcontracts that the contracts are coming. The big boys are tooling up and then the filtering down of subcontracts really begins.

Air Force Sales—The Air Force program has been reportedly disrupted partly by lack of machine tools. The dealer hints that a little contact work with aircraft purchasing agents may result in sales. They may help out in the dull summer months.

There will also be some rebuilding work circulating. The Air Force has invited its contractors to select machine tools from storage sites at Marietta, Ga., and Omaha, Neb.

Flood Survival—The story of industry's survival was in back of flood news of civilian suffering in the Midwest. The great inundation in Kansas City resulted in distress signals flying to the electrical equipment market in Pittsburgh.

At the crest of the flood, a Pittsburgh electrical equipment dealer received an emergency order for ten generating sets of 30 kw each from a glass manufacturer in Kansas City. Water had snuffed out his power equipment and he needed replacements quickly to get back into production.

The Pittsburgh man got the order at 2 p.m. that day. A little hustle and bustle on his part sent three large vans loaded with generating equipment to the stricken area. The power units were virtually new government surplus.

Demand from Steel—The crutch on which the electrical equipment field in Pittsburgh has been leaning is demand generated expansion of steel industry capacity. This is perhaps the largest single factor buoying up the market today.

Demand from the always faithful coal industry has slumped in recent months. However, the steel mills are in the market for virtually any type of motor. Major reason, as usual, is extended delivery dates for new equipment. Steel men can't afford to wait.

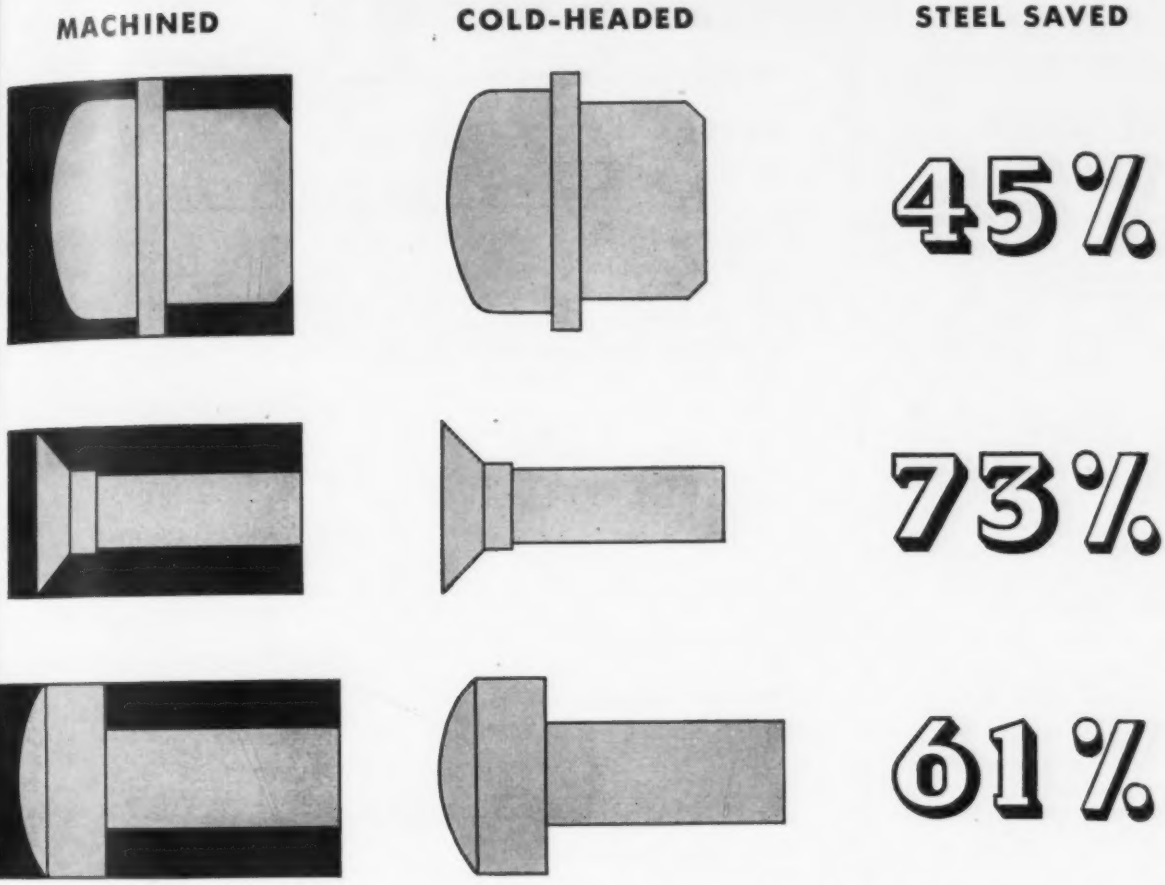
Still Healthy—The Pittsburgh machine tool market is still strong. This situation is contrary to the summer slowness of other markets. Dealers in Pittsburgh are swamped with requests to indicate what equipment they have available.

Demand for steel mill equipment continues active. One dealer reports he is loaded with business. Yet another dealer reports he is going strong but the tone of his market has somewhat softened.

Boiling in Fall — Pittsburgh people feel that demand will keep on an even keel throughout summer and then start boiling again from October on. Both big and small steel mills are in the market—either because of a desire to expand production or because of a switch in operations plans.

Some of these people have in the past been loath to deal in used equipment but necessity has driven them into the market with a vengeance. With deliveries on some new equipment stretching out to as long as 2 years, chances are almost certain that business will remain at high levels for some time.

Cold-Heading Saves Steel



Data Courtesy of American Machinist

More steel products are being cold-headed than ever before. And for good reasons. It's not at all unusual, for example, to save over 50 pct in material and labor by cold-heading on products that would otherwise be made on screw machines or by milling operations.

Until fairly recently only the softer steels were suitable for cold-heading. But today even steels of medium-high carbon content are being cold-headed with notable success. As a result, many products are being redesigned so as to take advantage of the savings in steel and the lower production costs that cold-heading so often makes possible.

Supplying cold-heading wire is a Bethlehem specialty. In our modern wire mills we give special attention to cold-heading wire because it must be able to take a lot of punishment—upsetting, extrusion, slotting, punching, trimming, pointing, and other operations performed by cold-heading machines.

Proper internal soundness and freedom from injurious surface imperfections are of special importance because the heading or forging operation may cause even minor flaws to open up into wide cracks. Surface finish, accurate size, and uniformity of composition are some of the other details that we watch carefully in making cold-heading wire.

Call on our technical staff for assistance when you have a problem involving steel wire—for cold-heading or any other use.

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